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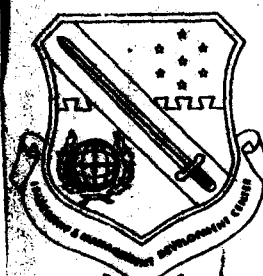
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AIR FORCE

PRODUCTIVITY SYMPOSIUM

held 12-13 February 1981
Maxwell AFB, Alabama.

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APR 22 1981

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LEADERSHIP AND MANAGEMENT DEVELOPMENT
AIR TRAINING COMMAND
Maxwell Air Force Base, Alabama 36111

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Organizational Assessment Package (OAP)		production enhancement												
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Air Force Productivity Symposium was co-hosted by the Leadership and Management Development Center and the Productivity and Research Office, Headquarters USAF, in February 1980. The purpose of the symposium was to present relevant productivity-related research and programs and to provide answers to the question, "What initiatives should be included in the Air Force Productivity Program?" This report represents the work of the Symposium and contains three parts. The first contains the results of discussion and														

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Block 20: recommendations of the Symposium. The second part contains copies of papers read or presented during paper sessions. The final section contains copies of materials used in briefings where no formal papers were available. A previous version of this report was published as an LMDC Working Paper and submitted to Symposium members only. This report is intended to update and replace that Working Paper.



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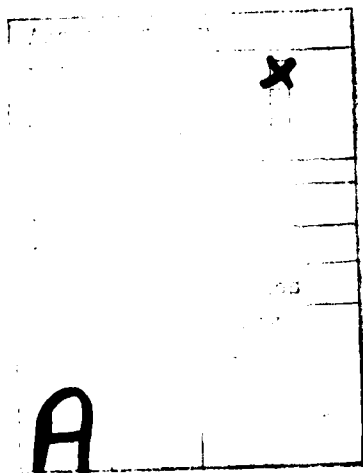
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FOREWORD

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Results of the
AIR FORCE PRODUCTIVITY SYMPOSIUM
(12-13 February 1980)

1. The Productivity and Research Office, Headquarters USAF, and the Leadership and Management Development Center conducted a Symposium on Air Force productivity 12-13 February 1980 at Maxwell Air Force Base, Alabama. The attendees are listed at attachment 1. The results of the Symposium will be organized into two main groupings: overall Symposium recommendations and suggestions that support the overall recommendations. The recommendations were made in response to the question: What Initiatives Should be Included in the Air Force Productivity Program?

Recommendations of the Symposium

1. Obtain and demonstrate top management/leadership support.
2. Establish an information cross-flow.
3. Develop a research program.
4. Evaluate organizational placement (productivity offices).
5. Establish reward/incentive system.

Discussion

1. Top Level Support

a. This Symposium identified top-level support as the most important aspect of the Productivity Program. Top leadership should define the broad concepts and goals of the program. Once the goals and concepts are formalized, they should be communicated downward in both functional and command channels. By communicating the goals and comments, personally, top leadership will lend its apparent emphasis and support to the program.

b. Top leadership should also become more visible by making statements in support of productivity efforts. The statements should be in speeches and also in articles published within both DOD and non-DOD publications. These statements and articles will communicate the top-level support message throughout the Air Force and indicate our efforts to non-DOD interested parties.

c. Top-level support is critical to the establishment of a new program, such as Productivity. Without the endorsement of top-level leadership, the Productivity Program will lack credibility and appear to be a program with little emphasis and consequently receive only minor attention by commanders and functional managers.

2. Information Cross-Flow

a. The second recommendation was to establish an information crossflow for the Productivity Program. Several suggestions were made that will offer mutual support of the proposed information program.

b. Establish a central clearing house for productivity information. The clearing house will cross-flow DOD and non-DOD information to productivity principals at all levels (Air Staff, MAJCOM-SOA), and specific agencies that have productivity enhancing/related missions (i.e., LMDC, AFIT, USAFA). The primary purpose of the clearing house concept is to help the commands avoid reinventing the wheel when staffing and implementing productivity initiatives.

c. Establish a publication that would serve as a productivity guide. This publication would serve as a bibliography of DOD and non-DOD programs. It would list current programs and a key person for information on that program. This publication should be incorporated in the pending Air Force regulation XX-XX on productivity.

d. Establish a quarterly publication to serve as an Air Force management journal. At present, several publications attempt to improve management by functional areas. With added emphasis on productivity, the separate publications could and should be brought together so that redundancy can be avoided. The primary function of the new publication will be to provide a primary voice, within the Air Force, to surface new ideas, research, methods and recommendations for improving Air Force management and consequently improve productivity. The publication could provide needed pro and con discussion of current topics or programs such as Word Processing and other capital investments.

3. Organizational Placement

a. The organizational placement of the Productivity Program offices should be changed from what has become inherently a manpower program. The Symposium recommendation is designed to remove what was perceived as a negative connotation of productivity. By manpower personnel running the program, some commanders may be hesitant to participate and identify the savings (manpower) because of the implication that saved resources would be taken away from them.

b. The Symposium recommends that the productivity office (whether Air Staff, MAJCOM-SOA) should be a separate reporting office to the Chief-of-Staff within the appropriate organization. The office should be staffed with full-time personnel (as opposed to assigning productivity as an additional duty). The Symposium recommends that additional manpower spaces be allocated to the MAJCOM-SOAs to manage the Productivity Program.

c. The symposium suggests that various productivity related programs (suggestion program, job enrichment, human relations, just to name a few) should be drawn together to provide the additional manpower and expertise to operate an effective program.

4. Research Program

a. A cornerstone of a successful productivity program is the continuing input from a comprehensive research source. Both pure and applied requirements need to be addressed. The requirements should address concerns of the Personnel community that become intervening variables in the productivity efforts, e.g. aging of the workforce and motivation. Although the Air Force Human Resources Laboratory is pursuing research in the productivity realm, the magnitude of the efforts is too small to meet the Air Force's productivity research needs. The Laboratory's productivity program is constrained by insufficient personnel and funding. The Symposium recommends that productivity requirements be identified and that additional funds be committed to productivity research.

b. Although addressed previously, the Symposium recommends that results of the research be specifically cross-flowed to all MAJCOM-SOAs and special agencies. Reduction of research-to-application time is necessary to receive the full benefit of the research efforts.

5. Reward/Recognition System

a. The Symposium fully supports the proposition that saved resources (whether manpower or dollars) will be reinvested within the unit which produced the savings, provided a valid requirement exists. This "reinvestment" policy is consistent with the spirit of the DOD 5010.31 which states "The savings should be reutilized at the lowest organizational level practical to provide an incentive for management." The Symposium recommends that the word "should" in this DOD excerpt be changed to "will" to emphasize this important management incentive. The Symposium further suggests that the resources be reinvested for a given period of time.

b. The Symposium recommends a study be made of all available personnel motivation systems/programs. From this study and evaluation, an evaluation should be made to see if there are sufficient reward and recognition programs to encourage productivity enhancing ideas and participation. Both intrinsic and extrinsic reward systems should be evaluated to determine their usefulness in promoting productivity-improvement behavior in the individual. A vigorous use of the existing or "new" (if needed) programs should be used and publicized to demonstrate the positive aspects of productivity for the individual and his unit.

6. Additional Recommendation

a. In addition to these recommendations, the Symposium recommended that a task group be formed to study the entire productivity improvement program. Although several of the recommendations included in this report are subject specific, others are very broad and require further study and investigation.

b. Some of the broad recommendations cover overlapping functions (e.g. information cross-flow and research) and the complete answer in others would require senior management approval prior to implementation. Because of the depth of the questions and problems, the Symposium attendees attempted to address the broad problem identification and highlight some of the possible solutions. The attendees recognized that with the limited time given to address the issues, only partial solutions could be proposed. Therefore, one of the Symposium recommendations is that a task force, authorized and supported, preferably by the Air Force Chief of Staff, be organized to study the major recommendations and problems. Some topics that the task group could address are discussed briefly below.

(1) The establishment of an Air Force Productivity Center which would be staffed by "experts" in the various productivity related fields. This central corps of experts could be used to evaluate programs, promote new efforts, coordinate research efforts, provide consultative roles for commanders, edit the proposed management journal, and provide training for command and base level productivity principals, and other duties to be determined by the task group.

(2) The task group should address whether a separate Air Force specialty code is needed for productivity officers and NCOs. As the field of productivity expands, individuals with a broad knowledge of productivity issues must be developed so that they can staff and direct Air Force, MAJCOM-SOA, and base-level efforts. At present, no formal education courses are available to teach the skills that productivity principals require. The task force will need to address what skills are needed by productivity principals and how these skills should be developed.

PRODUCTIVITY SYMPOSIUM
12-13 February 1980

<u>ATTENDEES</u>	<u>ORGANIZATION</u>	<u>AUTOVON</u>
Col Jack P. Bujalski	HQ USAF/MPMZ	697-4815
Col Claude S. Dodd, Jr	AFMEA/MEM	487-2470
Lt Col Robt DePhilippis	LMDC/DMC	875-7095
Lt Col Kenneth Hamilton	LMDC/AN	875-7302
Lt Col William Hendrix	HQ AFIT/ENS	785-4549
Lt Col David Wilkerson	LMDC/AN	875-7058
Lt Col David Muzio	AFMEDMET	875-2062
Maj Fredrick Crawford	HQ USAF/MPMZ	697-4815
Maj John R. Dydo	HQ USAF/MPXHM	224-8270
Maj Russell Lloyd	AFLC/XRV	787-6189
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Self-Reported Productivity: Relationships Among Sex,
Personnel Category and Functional Area.

Kenneth L. Hamilton, Lt Col, USAF

and

Lawrence O. Short, Major, USAF

Self-Reported Productivity: Relationships Among Sex,
Personnel Category and Functional Area.

Kenneth L. Hamilton, Lt Col, USAF
and
Lawrence O. Short, Major, USAF

Leadership and Management Development Center
Maxwell Air Force Base, Alabama 36112

Extensive work has been done by psychologists, organizational behavior theorists, and organizational development researchers in the area of work force improvements, quality of life, and work innovations. Many of these have been effective, some ineffective; most probably fall in the category of making things better (O'Toole, 1980).

It's unclear at this point in the research if these work improvements should be denoted as fads or long term transformations in the nature of organizations. Managers are often concerned as to whether the programs attempted in other organizations would be effective in their own organizations or only lead to more expense and even a greater risk of management failure. This can certainly be considered true of one crucial measure of effectiveness: Productivity.

The difficulties in studying productivity begin in two areas. One is defining what productivity is, and the other is determining how to measure it. It seemed to us that focusing on these issues could produce frustrating results for the researcher. In this paper therefore, we will take a fresh approach to productivity: examine the perceptions of employees about their own productivity.

The paper will be presented in three parts. First, the background of the research project will be developed. Second, the results of the data analysis will be presented. Finally, some conclusions based on the results will be drawn.

As previously mentioned, we are taking a different approach to productivity in this paper. We are concerned with whether there is, in fact, a relationship, as some have noted (see, for example, Engel, 1977), between perceived productivity and actual productivity. We are also concerned about the relationship of attitudinal changes and changes in behavior which may follow changes in attitude. Thus, as a consequence of measuring attitude changes, we may be in fact able to predict behavioral change in the long run. Specifically, we will look at the impact of three factors on perceived productivity: sex, personnel categories (officer, enlisted), and functional area (aircraft maintenance, operational flying duties, hospital, base support, and resource management).

Method

Instrumentation

We have measured perceived productivity by use of the Organizational Assessment Package (Hendrix and Halverson, 1979a, 1979b; Hendrix 1979). This survey is administered by Air Force personnel during the management consulting data-gathering process of the Leadership and Management Development Center, Maxwell AFB. One set of questions addresses the issue of work group effectiveness or perceived productivity. We ask five questions to measure perceived productivity using a seven point Likert scale of one (disagree strongly) to seven (agree strongly). These questions are as follows:

1. The quantity of output of your work group is very high.
2. The quality of output of your work group is very high.
3. When high priority work arises, such as short suspenses, crash programs, and schedule changes, the people in my work group do an outstanding job in handling these situations.
4. Your work group always gets maximum output from available resources (e.g., personnel and material).
5. Your work group's performance in comparison to similar work groups is very high.

Responses of all five of these questions are averaged for the factor which we have labeled as perceived productivity. The development of this factor was accomplished factor analytically as part of the validation process of the larger survey instrument.

Procedure

Data were collected on 18,211 Air Force officer and enlisted personnel. Within each of these two personnel categories subjects were partitioned by sex and by functional area. Data were then analyzed by use of a three-way analysis of covariance procedure, with age as the covariate. Within cell comparisons were computed following a procedure by Winer (1962, p. 244). The analysis of covariance was used to test the null hypotheses of:

1. No main effect due to personnel category;
2. No main effect due to sex;
3. No main effect due to functional area;

4. No two-way interaction between personnel category and sex;
5. No two-way interaction between personnel category and functional area.
6. No two-way interaction between sex and functional area; and
7. No three-way interaction among sex, personnel category and functional area.

The alpha level for all analyses was set at .10 to assure sufficient power without undue risk of Type I errors.

Results

Table 1 presents a detailed look at age, the covariate. As can be seen, considerable variation does exist on the covariate with maintenance showing the youngest force overall and operations the oldest. Figure 1 is a graphic presentation of the same data.

Insert Table 1 about here

Insert Figure 1 about here

Table 2 is the analysis of covariance summary table. As would be expected from inspection of Table 1 and Figure 1, the covariate was significant and, thus, important to control. Significant main effects for personnel category and functional area were obtained, thus enabling the rejection of null hypotheses 1 and 3. Null hypothesis 2 remained tenable. Similarly, significant two way interactions were obtained between personnel category and functional area and between sex and functional area. As such, null hypotheses 5 and 6 were rejected but null hypotheses 4 and 7 remained tenable.

Insert Table 2 about here

Tables 3 and 4 present the basic data which were used in the analysis of covariance procedure. Table 3 shows the data for officers and enlisted partitioned by sex and functional area with mean, number and standard deviation for each.

Insert Table 3 about here

Figures 2, 3 and 4 represent a graphical display of the two way interactions. Figure 2 deals with the interaction of sex and personnel category. As previously noted, no significant interaction between the two existed. Thus, males showed a higher level of perceived productivity than females across both levels of the personnel category factor.

Insert Figure 2 about here

Table 1
Mean Age
By Personnel Category, Sex and Functional Area

<u>Officer</u>	<u>Base Support</u>	<u>Resource Management</u>	<u>Aircraft Maintenance</u>	<u>Aircraft Operations</u>	<u>Medical</u>	<u>Total</u>
Male	x 37.2	34.8	33.9	31.1	34.4	33.7
	sd 8.3	7.2	7.1	6.3	6.9	7.2
Female	x 28.5	25.6	26.4	27.6	33.0	30.9
	sd 5.9	3.4	3.4	5.6	7.6	7.3
<u>Enlisted</u>						
Male	x 28.9	29.0	28.5	29.8	28.0	28.7
	sd 7.6	7.9	7.6	7.7	7.1	7.6
Female	x 24.1	23.9	22.9	24.2	23.8	23.7
	sd 4.4	4.3	3.1	5.4	4.2	4.2
<u>Total by Job Location</u>						
	29.3	28.8	28.3	30.3	29.2	29.0
	8.0	7.8	7.6	6.4	7.6	7.7

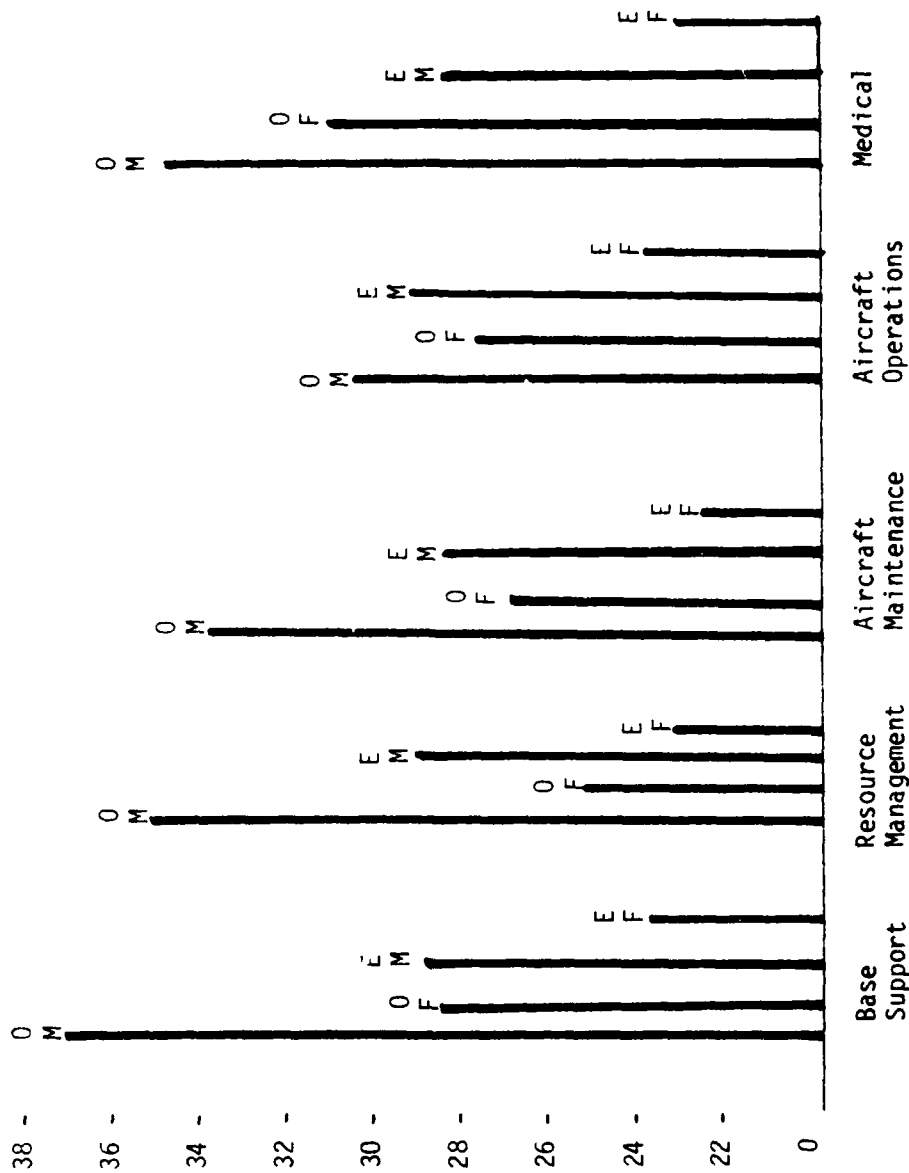


Figure 1. Average Age: Personnel Category, Sex, and Functional Area

Table 2

Analysis of Covariance
Perceived Productivity By
Personnel Category, Sex and Functional Area With Age

Source of Variation	Raw Regression Coefficient	Sum of Squares	df	Mean Square	F	Significance Of F
<u>Covariates</u>						
Age	0.031	1008.2	1	1008.2	667.3	0.000 ***
<u>Main Effects</u>						
Personnel Cat		8.7	1	8.7	5.8	0.016 *
Sex		2.6	1	2.6	1.7	0.188 ns
Functional Area		191.4	4	47.84	31.7	0.000 ***
<u>2-Way Interactions</u>						
Personnel Cat, Sex		1.6	1	1.6	1.0	0.304 ns
Personnel Cat, Functional Area		13.3	4	3.3	2.2	0.067 *
Sex, Functional Area		27.4	4	6.8	4.5	0.001 ***
<u>3-Way Interaction</u>						
Personnel Cat, Sex, Functional Area		2.9	4	0.7	0.5	0.754 ns
Residual		27482.8	18190	1.5		
Total		28778.3	18210	1.6		

*** p<.001

** p<.01

* p<.05

ns= not significant

Table 3
Mean Perceived Productivity
Adjusted for Age
By
Personnel Category, Sex and Functional Area

<u>Officer</u>		<u>Base Support</u>	<u>Resource Management</u>	<u>Aircraft Maintenance</u>	<u>Aircraft Operations</u>	<u>Medical</u>	<u>Total</u>
Male	x	5.53	5.80	5.81	5.81	5.59	5.70
	sd	1.16	0.90	0.99	0.99	1.06	1.05
	n	646	167	149	951	418	2331
Female	x	5.43	5.61	5.76	5.39	5.37	5.43
	sd	1.12	1.09	0.98	1.17	1.36	1.27
	n	46	33	26	14	229	348
<u>Enlisted</u>							
Male	x	5.42	5.67	5.55	5.76	5.58	5.54
	sd	1.37	1.22	1.20	1.18	1.28	1.28
	n	4879	2153	3016	602	1105	13755
Female	x	5.56	5.76	5.46	5.55	5.44	5.55
	sd	1.35	1.21	1.26	1.29	1.27	1.29
	n	618	337	382	93	347	1777
<u>Totals by Job Location</u>							
	x	5.45	5.69	5.55	5.80	5.54	5.56
	sd	1.35	1.20	1.20	1.07	1.25	1.25
	n	6189	2690	5573	1660	2099	18211

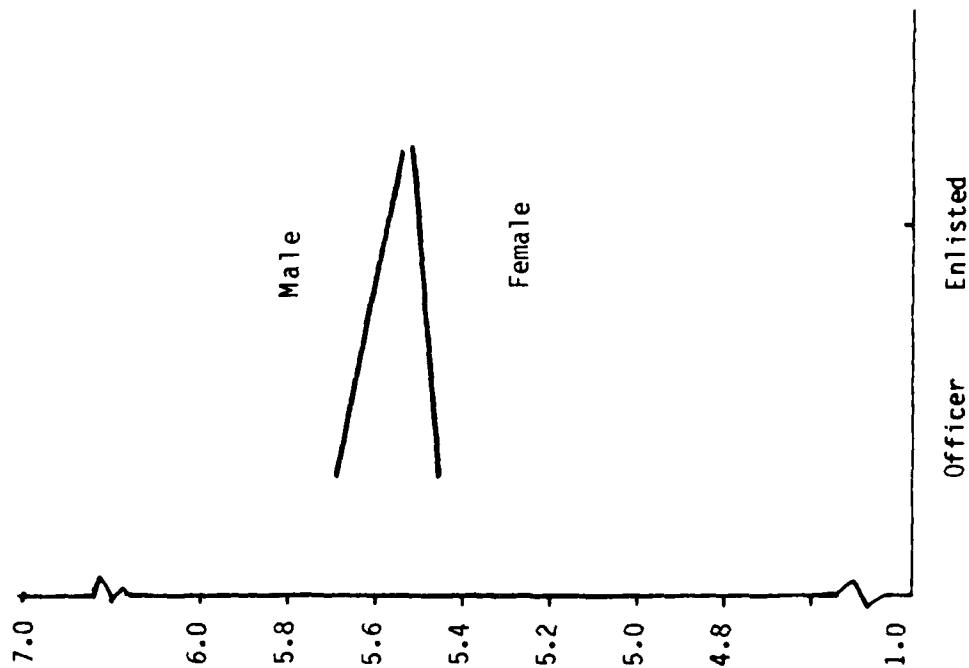


Figure 2. Perceived Productivity by Sex & Personnel Category

Figure 3 represents the interaction between personnel category and functional area. As shown in Table 2, this interaction is significant and is what Hopkins and Glass (1978) call an ordinal interaction. That is, officers still maintain higher perceived productivity than enlisted across all duty locations. The nature of the relationship between officer and enlisted, however, changed when perceptions of enlisted personnel in maintenance fell sharply.

Insert Figure 3 about here

Figure 4 presents the interaction of sex and functional area. Here, the interaction is significant and disordinal as males were higher than females in three of the functional areas. Here, males in operations show the highest perceived productivity, while females in hospital show the lowest.

Insert Figure 4 about here

Finally, Figure 5 is a summary presentation combining both personnel categories and sexes across functional area. Again, this graph shows consistent perceptions of perceived productivity except for those personnel in operations, who have higher perceptions. By reference to the interaction graphs, it seems likely that enlisted males are an important factor in this change.

Insert Figure 5 about here

Discussion and Conclusions

A difficulty in assessing the results of this analysis is the same as interpreting any self-reported measure. There is no absolute standard by which one or more groups may be found to be satisfactory or unsatisfactory. Thus, we can review the data from one of two perspectives:

- (1) Since the mean value of every cell is above the midpoint of the scale, we may conclude that there are no problems and that we are satisfied with the status quo.
- (2) Improvements in productivity are important, and even though there are no "hard" measures to compare among groups, there is real benefit to improving the level of perceived productivity of every group.

With perspective (1) always in mind, we shall adopt (2) as more realistic and proceed with interpreting the results.

Table 1 and Figure 1 actually were provided as background, but are important in understanding the ANCOVA results. We found in the ANCOVA that perceived productivity and age are positively correlated with a raw regression coefficient of .031. This means that before adjusting the

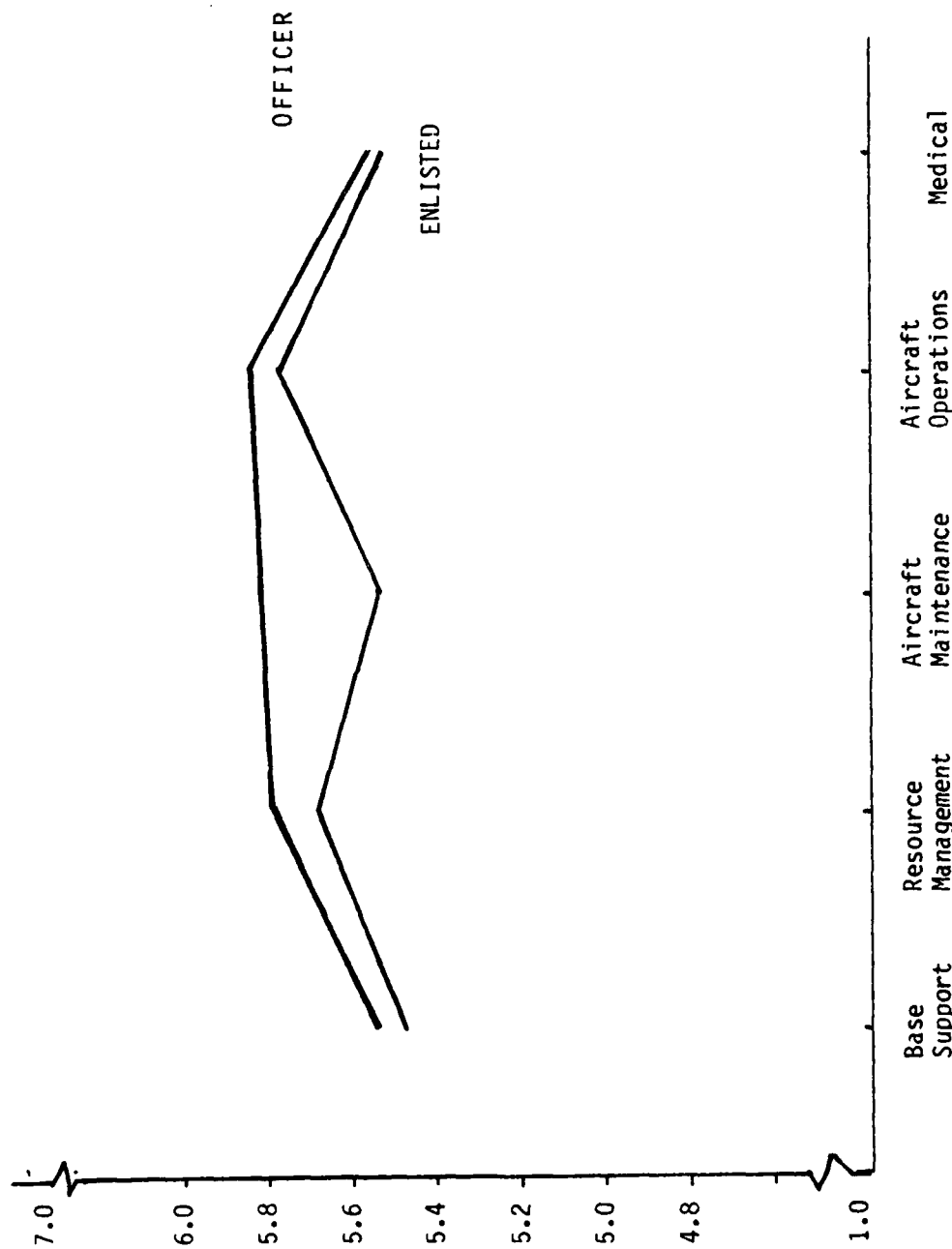


Figure 3. Perceived Productivity by Personnel Category & Functional Area

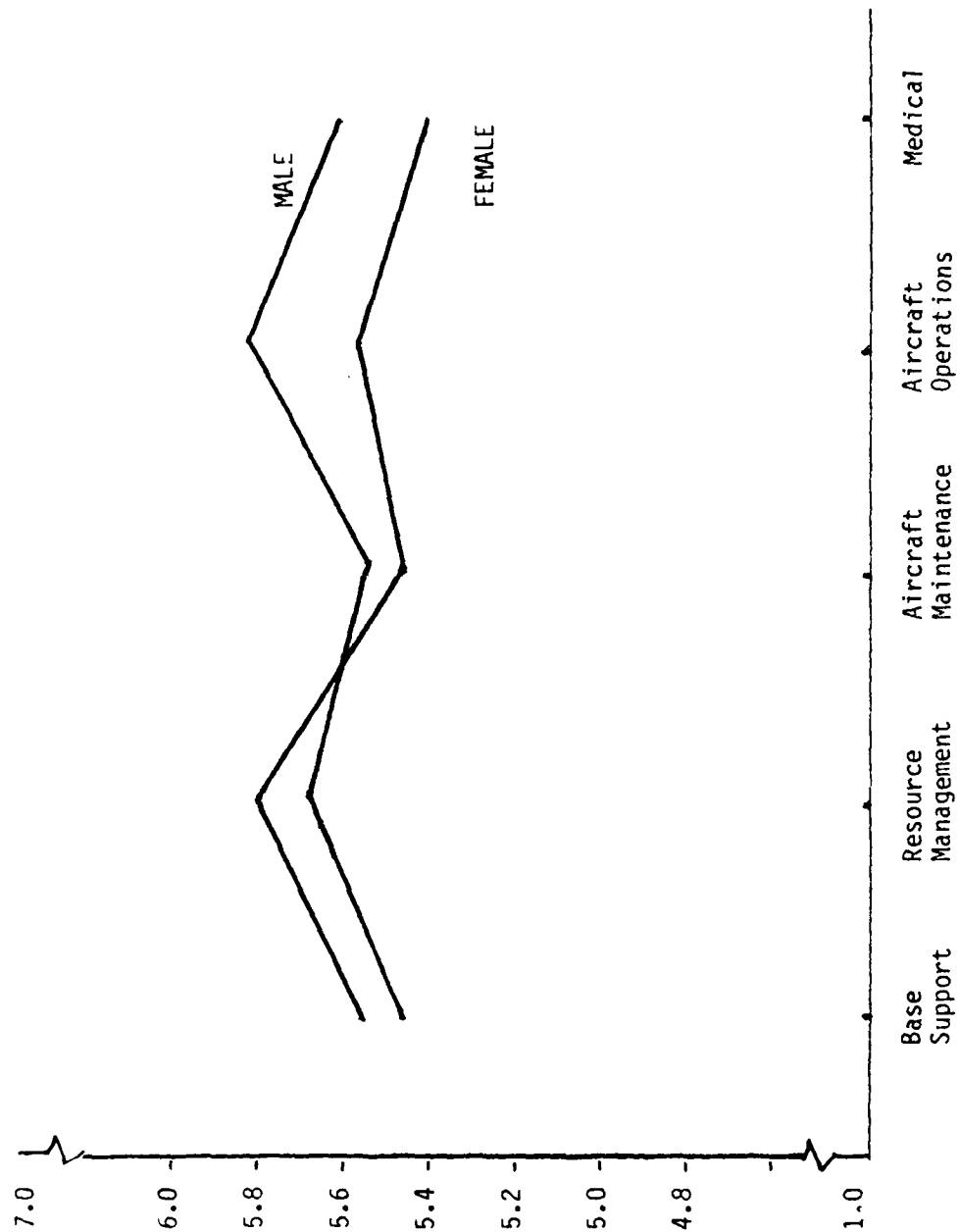


Figure 4. Perceived Productivity by Sex & Functional Area

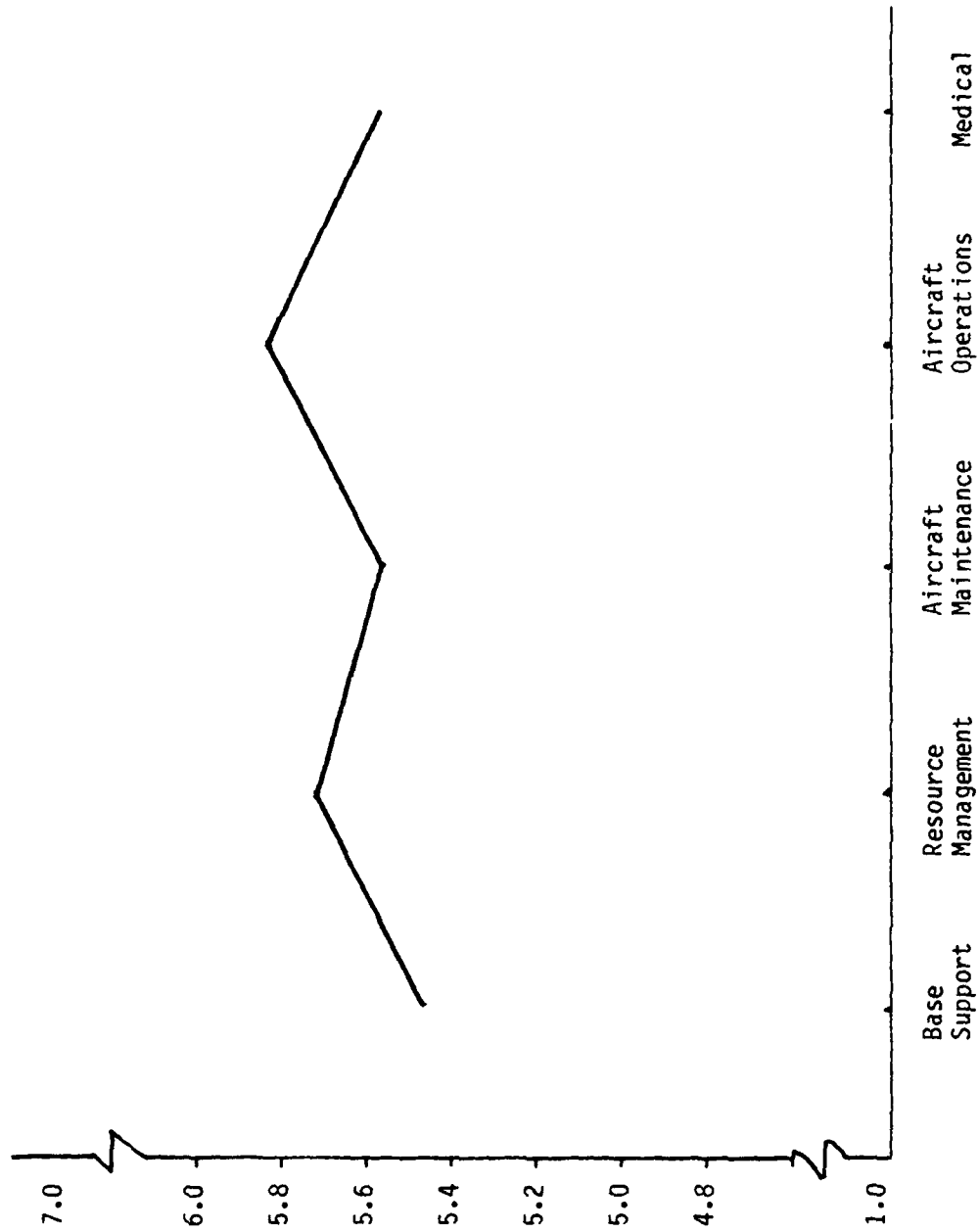


Figure 5. Perceived Productivity by Functional Area

self-reported scores for covariance effects, and given two groups of individuals such that all other things are equal except for a ten year difference in age, there would be a difference in their factor scores of 0.31. This gives a crude measure of difference due solely to age.

Members of a single work group rarely would have a ten year age span. This difference would more than likely denote supervisory-subordinate relationships within a functional area. By age alone we explained some of the variance of the factor scores. However, the amount of variance explained by age was not sufficient and therefore we controlled for the effects of age and then examined the effects of sex, personnel category, and functional area.

There were no significant main effects for sex. There was, however, a significant interaction between sex and functional area (Figure 4). Females in base support and resource management reported higher levels of perceived productivity than males in the hospital and the direct mission areas of aircraft maintenance and aircraft operations. This may be a consequence of differences in duties of males and females assigned to these different functional areas. That is, in base support and resource management, males and females may be performing duties that are much more similar. In aircraft maintenance and aircraft operations, however, males may have been predominantly performing supervisory and leadership roles, thereby perceiving greater levels of productivity than females who are performing administrative, or at best, junior duties within the functional area.

There were also significant main effects for functional area and interaction effects for functional area with personnel category and also with sex. Officers uniformly reported higher levels of perceived productivity in their work group than did enlisted personnel. The predominant break in otherwise parallel lines is a consequence of the enlisted personnel performing duties in aircraft maintenance. The officers in aircraft maintenance reported about the same levels of productivity as their counterparts in resource management and aircraft operations, all three of which are higher than officers in base support and medical activity. Enlisted personnel in resource management and aircraft operations reported higher scores than their counterparts in base support, medical activities, and aircraft maintenance.

The explanation as to why personnel assigned jobs with clearly defined output measures should express lower productivity than personnel assigned jobs with less clearly defined output measures is not apparent. Aircraft maintenance, for example, would appear to be among those few functional areas which have clearly defined measures of output. Aircraft maintenance people generally work on an airplane, see the airplane depart on a mission, and then greet that airplane upon its return. They are able to get immediate feedback about how well their previous activities supported the mission, and which repairs were not successful. Hospital people can see patients recovered, shots given,

cavities filled, etc. Base support activity, including such diverse activities as civil engineering and security police, can document physical plant repairs, fires put out, numbers of arrests, gates checked, or other units of physical activity. The output measures for resource management and operations seem far less clear.

Two interpretative options seem possible for these findings. The first option is that personnel in operations and resource management also have higher levels of job satisfaction and morale than personnel in the other three areas, and thus see themselves as also being more productive. On the opposite side of the coin, personnel in operations and research management may not have an accurate picture of their productivity because of the relative lack of clear output measures. Thus, personnel in these two areas may have a more unrealistic, and possibly more inflated, view of their productivity, while personnel in maintenance, hospital, and base support activities may have a more realistic view of their productivity.

The major conclusions of this paper have to do with the findings of differences in functional areas and the identification of certain areas for further research. Personnel who work in areas with more easily defined levels of output may be able to better report perceptions of productivity than personnel who work in areas which outputs cannot easily be related to physical units. Further work is necessary in each functional area as we have defined them here to determine causes for differences and to identify "hard" or objective measures of output. Given that we can then identify objective measures of output over time in the same unit, we may be able to then identify changes in levels of perceived productivity and relate them to changes in levels of physical productivity. After this is accomplished then we may be able to state with more confidence conclusions about the adequacy and desirability of the given level of reported productivity within a given functional area.

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Formal Techniques for Analysis and Design of Purposive Organizations

Alfred R. Fregly, PhD

DEPARTMENT OF THE AIR FORCE
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH (AFSC)
BOLLING AIR FORCE BASE, DC 20332

14 February 1980

Colonel F. P. Bujalski
HQ USAF/MPMZ
Room 5C514, Pentagon
Washington, DC 20330

Dear Colonel Bujalski

In lieu of my attendance at the Productivity Symposium at LMDC, Maxwell AFB, 12-13 February 1980, and therefore, the missed opportunity to participate directly and to provide orally information about the AFOSR-sponsored work productivity research program, the following written information is provided in keeping with my recent TELCON with Capt Fred Crawford.

Atch 1 consists of brief summaries of efforts recently completed are still on-going but soon to be completed. No additional efforts are contemplated after FY 1980.

Atch 1 may be summarized as addressing problems and issues concerned with organizational design (Ding, et al;), development of bio-feedback processes (Dinnot), communication strategies (Huseman at Georgia and Taylor at USAFA), job enrichment and job design/redesign in relation to goal setting (Rosenbach and Umstat at USAFA), development of a computerized base operating support model of manpower input/work output relationships (Schmitz), and modeling of maintenance productivity process (White at Georgia Tech and Young at Arizona State University). With the exception of the Schmitz effort relative to the interests of your organization, it is anticipated that the results of these efforts will be considered for journal publication.

As a matter of special interest, Dr. Harry Caldwell, Dept of Geography, University of Idaho, Moscow, Idaho, is scheduled to report to AFOSR in June 1980 as a University Resident Research Fellow. He has been working with AF/LEEX over the years on related matters. At AFOSR

he will systematically explore work productivity and quality of life interrelationship with the expectation of collating and defining R & D requirements for Air Force consideration. It is anticipated that this Directorate will assist in this effort, mainly in terms of providing literature and contacts, including your office.

Please do not hesitate to contact us if we might provide additional information or otherwise be of assistance.

Sincerely

/S/

ALFRED R. FREGLY, PHD
Program Manager
Life Science Directorate

1 Atch
Work Unit Summaries

5. INSTITUTION University of Illinois		6. DEPARTMENT	
7. CITY Champaign Urbana		8. STATE OR COUNTRY Illinois 61801	
9. PRINCIPAL INVESTIGATOR Dr. R. M. Dinnat			
10. TITLE OF PROPOSAL BRAINWAVE EMISSION AS A MEASURABLE PRODUCTION TASK			
11. REMARKS MIPR to USACERL			
12. PROPOSAL COST (Total) \$38,820	13. DURATION (Total months) 12	14. SOURCE <input checked="" type="checkbox"/> UNSOLICITED <input type="checkbox"/> SOLICITED	15. SCIENTIFIC AREA CODE 05.10
16. OTHER IDENTIFICATION			

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			FDD				

9. NARRATIVE TEXT (Double Space) ☒ OBJECTIVE ☐ APPROACH ☐ PROGRESS FROM: TO:

AIR FORCE FUNCTION - Enhancement of work productivity is crucial for optimizing limited Air Force personnel and manpower resources. DEFICIENCY - Existing measures of work productivity are severely lacking in reliability and validity due to the elusive problem of defining meaningful criteria. OBJECTIVE - The task of emitting brainwaves (the brainwave task), wherein productivity can be readily and reliably measured, is proposed as a surrogate task for use in studying the effects of changes in work procedures and/or the work environment. HOW RESEARCH CONTRIBUTES - Successful determination of the feasibility of the brainwave task as a means of objectively and reliably assessing productivity will allow new criteria development and applications generally in Air Force work situations.

MASIS NARRATIVE INPUT DATA						DATE 15 Aug 79	
1. TYPE SUBMISSION <input checked="" type="checkbox"/> INITIAL <input type="checkbox"/> UPDATE <input type="checkbox"/> FINAL WU START DATE WU END DATE				2. INSTRUMENT NUMBER/JOB ORDER NUMBER NL-79-104 Un IL/Dinnat		3. MASIS ACCESS NO.	
4. INVENTION INDICATOR <input type="checkbox"/> ACTUAL <input type="checkbox"/> PROBABLE <input type="checkbox"/> POSSIBLE <input type="checkbox"/> NONE				5. OFFICE SYMBOL NL		6. RESEARCH MONITOR Dr Alfred R. Fregly	
7. CLASSIFICATION/GDS OR XGDS CATEGORY							
8. MASIS CODING USE ONLY							
1 CLASS	2-7 ACCESSION	8	9-11	12	13-28 INSTRUMENT NUMBER/JOB ORDER NUMBER	29-34 FROM	35-40 TO
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9. NARRATIVE TEXT (Double Space) <input type="checkbox"/> OBJECTIVE <input checked="" type="checkbox"/> APPROACH <input type="checkbox"/> PROGRESS FROM: TO:							
<u>APPROACH</u> - The usefulness of the brainwave task as a surrogate is predicated on certain hypotheses about the behavior of people's production functions when performing the brainwave task. The production function is the average value over "N" production runs of brainwave productivity expressed as a continuous function of elapsed time. A person's production function is expected to stabilize as the number of production runs increases. The shape and/or amplitude of the function is expected to differ when the brainwave task is being performed with and without the use of biofeedback and to vary with changes in work procedures and work environments. The validity of these and several other hypotheses about brainwave production functions will be tested in a series of six experiments wherein only the alpha-wave frequency band (8-12 Hz) will be used for the brainwave task.							

PREPARED ON 07 NOV 79

AS OF 79 OCT 29 PCN UB458-05163

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GEORGIA UNIVERSITY OF
ATHENS, GA

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STRATEGIES FOR IMPROVING US AIR FORCE PRODUCTIVITY

COSATI-0509 .PERSONNEL SELECT, TRNG, EVAL LATEST PR- 79 0898

INSTRUMENT NUMBER	DOLLARS	MYRS.	DURATION	SOURCE	FY PROJ TK
F49620-79-C-0081	\$26,087	2.88	79JUN01-80MAY31	AFOSR	79 2313 A3
F49620-79-C-0081	\$52,173	.00	-	AFOSR	80 2313 A3

OBJECTIVE - 11 APR 79

(U) AF FUNCTION-IN THE MILITARY SETTING, PRESSURES FOR INCREASING PRODUCTIVITY RELATE TO EITHER MAINTAINING CURRENT MILITARY CAPABILITIES WITH FEWER RESOURCES OR INCREASING MILITARY CAPABILITIES WITH THE CURRENT LEVEL OF RESOURCES. DEFICIENCY-THE BASIC PROBLEM HAS BEEN IN COMING UP WITH ANY MEANINGFUL APPROACH TO MEASURING AND INFLUENCING 'CAPABILITIES', OR CORRESPONDING UNIT 'PERFORMANCE'. OBJECTIVE-THE RESEARCH PROPOSES TO DEVELOP (1) A METHODOLOGY WHICH CAN BE GENERALLY USED TO ASSESS UNIT AND INDIVIDUAL PERFORMANCE LEVELS, AND (2) APPROACHES TO INVESTIGATE THE POTENTIAL RELATIONSHIP OF COMMUNICATION BEHAVIORS TO GROUP AND INDIVIDUAL PERFORMANCE. HOW RESEARCH CONTRIBUTES-THE RESEARCH WILL GATHER DATA ESSENTIAL FOR THE TESTING OF A COMMUNICATION-PRODUCTIVITY MODEL WITHIN THE AIR FORCE SETTING. SUPPORT OF THE MODEL WOULD YIELD DATA DIRECTLY APPLICABLE TO THE ISSUE OF INCREASED PRODUCTIVITY.

APPROACH - 11 APR 79

(U) THROUGH THE USE OF SUCH RESEARCH TECHNIQUES AS CLINICAL INTERVIEWS, ORGANIZATIONAL ANALYSIS, AND SURVEYS THE RESEARCH WILL (1) IDENTIFY OPERATING FUNCTIONS IN NEED OF PRODUCTIVITY RESEARCH, (2) IDENTIFY SPECIFIC OPERATING UNITS RECOGNIZED TO HAVE HIGH AND LOW PRODUCTIVITY, AND (3) DETERMINE THE COMMUNICATION CHARACTERISTICS ASSOCIATED WITH DIFFERING LEVELS OF ORGANIZATIONAL AND INDIVIDUAL

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UNITED STATES AIR FORCE ACADEMY
USAF ACADEMY, COLO

A STRATEGY FOR JOB ENRICHMENT TO IMPROVE INDIVIDUAL AND
ORGANIZATIONAL PRODUCTIVITY

COSATI-0509 PERSONNEL SELECT, TRNG, EVAL LATEST PR- 79 0455

INSTRUMENT NUMBER
PO -79-00004

DOLLARS MYRS DURATION SOURCE FY PROJ TK
\$3,133 .00 78OCT01-79MAY31 AFOSR 79 2313 A3

OBJECTIVE - 07 FEB 79

(U) AF FUNCTION-THIS PROJECT OFFERS A UNIQUE OPPORTUNITY FOR CONDUCTING A CONTROLLED, LONGITUDINAL FIELD EXPERIMENT TO SCIENTIFICALLY MEASURE THE EFFECTS OF WORK REDESIGN ON PRODUCTIVITY AND SATISFACTION IN A DYNAMIC MILITARY ENVIRONMENT. DEFICIENCY-THE DISSATISFACTION THAT PERSONNEL EXPERIENCE WITH THE QUALITY OF THEIR WORK LIFE IS PRESENT IN THE MILITARY AS IT IS IN PRIVATE ENTERPRISE. OBJECTIVE-BY MEANS OF WORK REDESIGN, IMPROVEMENT OF THE BASIC RELATIONSHIP BETWEEN A PERSON AND HIS (HER) WORK IS EXPECTED. HOW RESEARCH CONTRIBUTES-IMPROVING THE QUALITY OF WORK THROUGH EFFECTIVE WORK REDESIGN THROUGH AN ATTEMPT TO CHANGE THE WORK BEHAVIOR ITSELF, RATHER THAN ATTEMPTING TO CHANGE WORKER ATTITUDES FIRST. IS EXPECTED TO RESULT IN GENUINE INTERNAL WORK MOTIVATION.

APPROACH - 07 FEB 79

(U) A CONTROLLED LONGITUDINAL FIELD TEST OF THE EFFECT OF JOB ENRICHMENT ON PRODUCTIVITY IS PLANNED FOR SEYMOUR-JOHNSON AFB FOR THE JOBS OF VEHICLE OPERATIONS AND VEHICLE MAINTENANCE SPECIALIST. MULTIPLE EXPERIMENTAL AND CONTROL GROUPS WILL BE EMPLOYED, AND INDIVIDUAL DIFFERENCE VARIABLES SUCH AS GROWTH AND ACHIEVEMENT NEEDS WILL BE RELATED TO THE MODERATING EFFECTS OF ORGANIZATIONAL CLIMATE.

PREPARED ON 07 NOV 79

AS OF 79 OCT 29 PCN UB458-05163

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GENERAL RESEARCH CORP
 MCLEAN, VA

DEVELOPMENT OF A GENERALIZED EXPLANATORY BASE OPERATING SUPPORT
 MODEL

COSATI-0501 .ADMINISTRATION AND MANAGEMENT LATEST PR- 79 0990

INSTRUMENT NUMBER	DOLLARS	MYRS	DURATION	SOURCE	FY PROJ TK
F49620-79-C-0146	\$66,599	1.20	79JUN01-79NOV30	AFOSR	79 2313 A3
F49620-79-C-0146	\$33,299	.00	-	AFOSR	80 2313 A3

OBJECTIVE - 27 MAR 79

(U) AF FUNCTION-THE MANAGEMENT OF BASE OPERATING SUPPORT (BOS) MANPOWER AND ASSOCIATED WORKLOAD REQUIREMENTS IN THE AGGREGATE AND THEIR INTEGRATION INTO THE OVERALL DEFENSE PLANNING, PROGRAMMING, AND BUDGETING PROCESS IS A REQUIRED FUNCTION OF THE AIR STAFF FOR JUSTIFICATION OF MANNING REQUIREMENTS. DEFICIENCY-RESEARCH AINED AT FURTHER DEVELOPMENT OF BOS MANPOWER/WORKLOAD RELATIONSHIPS IS ESSENTIAL FOR ENHANCING AIR STAFF MANPOWER PLANNING FUNCTIONS. OBJECTIVE-THE RESEARCH WILL FULLY DEVELOP AND DEMONSTRATE AN ON-TIME INTERACTIVE GENERALIZED EXPLANATORY BASE OPERATING SUPPORT (GEBS) MODEL COVERING THE TEST COMMANDS (ISAC, TAC, ATC) WITH A DESIRED DEGREE OF DETAIL AND SOPHISTICATION AND ASSESS AND PROTOTYPICALLY DEMONSTRATE FOR THESE COMMANDS A PROPOSED MODEL EXTENSION TO COVER SELECTED MISSION IMPACTS OF BOS CHANGES. HOW RESEARCH CONTRIBUTES-THE ON LINE AIR FORCE WIDE GEBS MODEL AND ASSOCIATED WORKLOAD INDICATOR DEVELOPMENT WILL PROVIDE THE AIR STAFF A RAPID REACTION AUTOMATED CAPABILITY TO FORECAST THE IMPACT OF BOS MANPOWER CHANGES INCLUDING SUCH APPLICATIONS AS (1) ANALYSIS OF COMMAND AUTHORIZATIONS RELATIVE TO OUTPUT TRENDS AND DEVELOPMENT OF RECOMMENDATIONS FOR INTER-COMMAND REBALANCING OF ALLOCATIONS, (2) PREPARATION OF INPUTS TO ZERO BASE BUDGET DECISION PACKAGES FOR BOS PROGRAM ELEMENTS, AND (3) VALIDATION OR UPDATE OF FYDP PROGRAMMING FACTORS FOR BOS.

SP-REACH - 27 MAR 79

(U) DEVELOPMENT OF THE MODEL WILL BE BASED ON CONCISE SYSTEMS AND OPERATIONS RESEARCH AND ANALYSIS. GROSS WORKLOAD MEASURES WILL BE REFINED TO MORE RELIABLY REFLECT WORKLOAD DATA CONTENT AND PHYSICAL OUTPUTS. PREVIOUSLY DERIVED FACTORS WILL BE REFINED AND UPDATED USING CURRENT AND ANNUALIZED DATA. PRECISE WORKLOAD/INDICATOR MANPOWER INTERRELATIONSHIPS WILL BE INCORPORATED TO REALISTICALLY SIMULATE THE COMPLEX IMPACT OF BOS MANPOWER ADJUSTMENTS AND ASSOCIATED CHANGES. THE MODEL WILL HAVE THE CAPABILITY OF SIMULATING THE EFFECTS OF CHANGES INITIATED EITHER THROUGH WORKLOAD ADJUSTMENT(S) OR MANPOWER CHANGE(S). ADDITIONAL DATA ON PRIMARY MISSION ACTIVITY FOR CORRELATION OF THE IMPACT OF BOS CHANGES INCLUDE ALTERNATIVE MEASURES OF MISSION EFFECTIVENESS/READINESS WILL BE COLLECTED. AGGREGATE BOS RELATIONSHIPS TO PRIMARY MISSION CAPABILITY WILL BE ANALYZED IN SUCH BOS AREAS AS SUPPLY, EQUIPMENT AND MAINTENANCE. THE RESEARCH WILL FOCUS ON DETERMINING THE VALIDITY AND CONSISTENCY OF SUCH RELATIONSHIPS, AND THE MOST USABLE FORM FOR MODELING TEST COMMAND MISSION/BOS MANPOWER/WORKLOAD RELATIONSHIPS FOR EXTENSION TO OTHER COMMANDS WILL BE SELECTED.

PROGRESS-

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UNITED STATES AIR FORCE ACADEMY
 USAF ACADEMY, COLO

STRUCTURING TECHNICAL COMMUNICATION PATTERNS FOR WORK GROUP
 EFFECTIVENESS IN AIR FORCE RESEARCH AND DEVELOPMENT

COSATI-0509 .PERSONNEL SELECT, TRNG, EVAL LATEST PR- 78 0844

INSTRUMENT NUMBER	DOLLARS	MYRS	DURATION	SOURCE	FY PROJ TK
PO -78-00020	\$1,000	.00	78FEB01-78SEP30	AFOSR	78 2313 A3
PO -78-00020	\$500	.00	-	AFOSR	79 2313 A3

OBJECTIVE - 14 JUL 78

(U) AF FUNCTION-COMMUNICATION WITH THE EXTERNAL ENVIRONMENT HAS BEEN SHOWN TO BE CRUCIAL TO THE EFFECTIVENESS OF RESEARCH AND DEVELOPMENT LABORATORIES IN RAPIDLY CHANGING FIELDS. AT THE SAME TIME COMMUNICATION ACROSS ORGANIZATIONAL BOUNDARIES TENDS TO BE DIFFICULT, AND THE USE OF SOURCES OUTSIDE THE ORGANIZATION BY ENGINEERS TENDS TO BE INFREQUENT. DEFICIENCY-INFORMATION SOURCES AVAILABLE TO ENGINEERS ARE NOT SUFFICIENTLY KNOWN TO BE FULLY UTILIZED. OBJECTIVE-THE RESEARCH WILL STUDY TECHNICAL COMMUNICATION PATTERNS IN SELECTED RESEARCH AND DEVELOPMENT WORK GROUPS IN AN AIR FORCE LABORATORY. HOW WORK CONTRIBUTES-THE RESEARCH HAS IMPLICATIONS FOR STRUCTURING AND ENHANCING ORGANIZATIONAL EFFECTIVENESS AND EFFICIENCY. IT IS POSTULATED THAT THOSE UNITS WITH DEFINED NETWORKS OF TECHNICAL COMMUNICATION WILL BE RATED HIGHER IN PERFORMANCE IN TERMS OF PRODUCTIVITY AND COST EFFICIENCY. IT IS IMPORTANT TO ALL AF RESEARCH AND DEVELOPMENT ACTIVITIES THAT THE RELATIONSHIPS BETWEEN TECHNICAL COMMUNICATION PATTERNS AND EFFECTIVENESS BE UNDERSTOOD AND STRUCTURED FOR OPTIMIZING JOB SATISFACTION AND PERFORMANCE.

APPROACH - 14 JUL 78

(U) AN ON-SITE STUDY OF SPATIAL RELATIONSHIPS BETWEEN COMMUNICATORS, PERCEPTIONS OF TECHNICAL COMMUNICATION NETWORKS AND GROUP PERFORMANCE MEASUREMENT WILL BE

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CONDUCTED AT AN AF LABORATORY. THE DISTANCE BETWEEN COMMUNICATORS IN SELECTED WORK GROUPS WILL BE MEASURED BY MEANS OF QUESTIONNAIRES. SELECTION OF GROUPS WITH DIVERGENT LOCATION STRUCTURES WILL ALLOW THE MEASUREMENT OF DIFFERENCES IN COMMUNICATION PATTERNS. ALL MEMBERS OF THE SELECTED WORK GROUPS WILL BE INTERVIEWED TO VALIDATE THE QUESTIONNAIRE DATA AND TO ASCERTAIN INDIVIDUAL CHARACTERISTICS THAT MIGHT MITIGATE EFFECTIVENESS IN TECHNICAL COMMUNICATION NETWORKS. LABORATORY ADMINISTRATORS WILL ASSIST IN DEVELOPING PERFORMANCE CRITERIA TO TEST THE PROPOSITION THAT TECHNICAL COMMUNICATION STRUCTURE IS LINKED TO PERFORMANCE.

PROGRESS-Z 01 FEB 78 TO 30 SEP 78 (FINAL-Z)

(U) INDIVIDUALS IDENTIFIED AS TECHNOLOGICAL GATEKEEPERS HAVE, FOR THE MOST PART, BEEN PROMOTED TO SUPERVISORY POSITIONS WITHIN THE LABORATORY AND, GENERALLY, THEY STILL FUNCTION AS GATEKEEPERS. FREQUENCY OF TECHNICAL COMMUNICATION STRUCTURES SEEM LESS PROMOUNCED THAN IN PREVIOUS STUDIES, BUT THE FREQUENCY OF CONTACT WITH THE EXTERNAL ENVIRONMENT REMAINS THE SAME AS PREVIOUS INVESTIGATIONS. WHETHER THE CHANGE IN TECHNICAL COMMUNICATION FREQUENCIES IS THE RESULT OF A REDUCTION IN PERSONNEL AT THE LABORATORY UNDER STUDY OR THE FAILURE OF NEW GATEKEEPERS TO EMERGE WILL BE DETERMINED. EXTENSIVE INTERVIEWS WITH LABORATORY SUPERVISORY PERSONNEL TO IDENTIFY CAUSAL FACTORS ARE UNDERGOING EVALUATION. INTERVIEW DATA ARE BEING COMPARED WITH QUESTIONNAIRE DATA GATHERED SEVERAL MONTHS AGO. INDEPENDENT MEASURES OF WORK GROUP EFFECTIVENESS AND EFFICIENCY APPEAR TO CORRELATE AND ARE LINKED TO TECHNICAL COMMUNICATION ACTIVITY. AN ADDITIONAL MODERATING VARIABLE IS IDENTIFIED - TECHNICAL SPECIALITY, WHICH RELATED TO THE TYPE OF INFORMATION INVOLVED. THE INFLUENCE OF THIS MODERATING VARIABLE IS ALSO THE FOCUS OF CURRENT STUDIES.

PREPARED ON 07 NOV 79

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UNITED STATES AIR FORCE ACADEMY
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IMPROVING ORGANIZATIONAL EFFECTIVENESS IN THE AIR FORCE THROUGH JO
REDESIGN

COSATI-0509 .PERSONNEL SELECT, TRNG, EVAL LATEST PR- 79 1101

INSTRUMENT NUMBER	DOLLARS	MYRS	DURATION	SOURCE	FY PROJ TK
PD -79-00011	\$1,200	.00	79JUN01-79SEP30	AFOSR	79 2313 A3

OBJECTIVE - 10 MAY 79

(U) AF FUNCTION-AIR FORCE MANAGERS FACE THE CHALLENGE OF ALTERING JOB STRUCTURES BY MEANS OF JOB ENRICHMENT TO IMPROVE MOTIVATION AND PRODUCTIVITY. DEFICIENCY-DULL, REPETITIVE, SEEMINGLY MEANINGLESS TASKS WHICH OFFER LIMITED CHALLENGES AND/OR AUTONOMY REDUCE BOTH INDIVIDUAL AND OPERATIONAL PRODUCTIVITY. OBJECTIVE-BY MEANS OF RIGOROUS METHODOLOGY, A LONGITUDINAL STUDY OF JOB ENRICHMENT FACTORS AND THEIR INTERRELATIONSHIPS WILL ESTABLISH GOAL SETTING PROGRAMS THAT SHOULD RESULT IN IMPROVED ORGANIZATIONAL EFFECTIVENESS. HOW RESEARCH CONTRIBUTES-AN EVALUATION OF JOB ENRICHMENT PROCESSES AND MEASUREMENT OF THE OUTCOMES OF ENRICHMENT WILL PROVIDE THE MEANS FOR POSSIBLE IMPROVEMENTS IN TERMS OF HIGHER PRODUCTIVITY, REDUCE TURNOVER AND ABSENTEEISM AND, THEREBY, REDUCE MANPOWER COSTS TO THE AIR FORCE.

APPROACH - 10 MAY 79

(U) FIELD EXPERIMENTS ON JOB ENRICHMENT AND GOAL SETTING WILL BE CONDUCTED, AND A CORRELATIVE STUDY WILL CLARIFY RELATIONSHIPS BETWEEN VARIOUS GOAL CHARACTERISTICS AND ENRICHMENT CHARACTERISTICS SO THAT MORE EFFECTIVE GOAL SETTING PROGRAMS MAY BE REALIZED.

PROGRESS-

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AS OF 29 OCT 79 FOR UB458-05163

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AUBURN UNIVERSITY
 AUBURN, ALA

MAINTENANCE PRODUCTIVITY

COSATT-0501 .ADMINISTRATION AND MANAGEMENT LATEST PR- 79 0372

INSTRUMENT NUMBER	DOLLARS	MYRS	DURATION	SOURCE	FY PROJ TK
AFOSR-79-0016 A	\$59,544	1.10	78OCT01-79DEC31	AFOSR	79 2313 A3

OBJECTIVE - 06 FEB 79

(U) AF FUNCTION-THE MISSION OF THE UNITED STATES AIR FORCE HAS REQUIRED THE DEVELOPMENT AND OPERATION OF VERY COMPLEX AND HIGHLY SOPHISTICATED SYSTEMS. VARIOUS MEASURES HAVE BEEN UTILIZED FOR INDICATING THE EFFECTIVENESS OF SUCH SYSTEMS. DEFICIENCY- DESPITE THE UTILIZATION OF THE SAME EQUIPMENT AND OF PERSONNEL WITH THE SAME TECHNICAL QUALIFICATIONS, CERTAIN SYSTEMS SEEM TO PERFORM AT A MUCH HIGHER LEVEL AT SOME BASES THAN AT OTHERS. WHILE MANY AIR FORCE SYSTEMS MAY QUALIFY FOR AN INTENSE ANALYSIS, THE MAINTENANCE SYSTEM IS OF MAJOR IMPORTANCE IN THE AIR FORCE MISSION. OBJECTIVE- FACTORS SUCH AS ORGANIZATION, MANAGEMENT, MOTIVATION, PLANNING, INFORMATION FLOW, AND THEIR MANY INTERACTIONS CAN HAVE A SIGNIFICANT IMPACT UPON MAINTENANCE SYSTEM EFFECTIVENESS. WITH THE INTENTION OF IMPROVING THE MAINTENANCE ACTIVITY OF THE AIRFORCE, THE RESEARCH WILL IDENTIFY THOSE FACTORS WHICH HAVE A SIGNIFICANT EFFECT UPON THE EFFECTIVENESS OF THE MAINTENANCE PROGRAM. HOW RESEARCH CONTRIBUTES-THIS IDENTIFICATION CAN PROVIDE FOCAL POINTS FOR EFFORTS TO IMPROVE MAINTENANCE SYSTEM EFFECTIVENESS. THE BASIS METHODOLOGY TO BE UTILIZED AND THE EXPERIENCE GAINED WILL BE OF VALUE IN STUDYING AND IMPROVING OTHER AIR FORCE SYSTEMS

APPROACH - 06 FEB 79

(U) THE RESEARCH WILL CONSIST OF THREE BASIC FUNCTIONS- (1) THE CREATION OF AN INFORMATION FLOW DIAGRAM OF PRESENT

PROCEDURES. (2) THE CONDUCT OF WORK SAMPLING STUDY, AND (3) THE DEVELOPMENT OF A TEST QUESTIONNAIRE AND ITS UTILIZATION WITH AIR FORCE PERSONNEL. THE STUDY WILL RESULT IN A PLAN WHICH CAN BE USED BY THE AIR FORCE TO STUDY KEY FACTORS INVOLVED IN MAINTENANCE AND TO IMPLEMENT IMPROVEMENTS.

PROGRESS-

PAGE 203

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PREPARED ON 07 NOV 79

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ARIZONA STATE UNIVERSITY
 TEMPE, ARIZ

DEVELOPMENT OF AN EFFECTIVENESS PLANNING EVALUATION MODEL FOR
 AIR FORCE MAINTENANCE ORGANIZATIONS

COSATI-0509 .PERSONNEL SELECT, TRNG, EVAL LATEST PR- 79 0866

INSTRUMENT NUMBER DOLLARS MYRS DURATION SOURCE FY PROJ TK
 AFOSR-79-0111 \$10,000 .14 79MAY01-80FEB15 AFOSR 79 2313 D9

OBJECTIVE - 15 FEB 79

(U) AF FUNCTION-A MAJOR 1970'S OBJECTIVE OF THE DOD IS TO IMPROVE THE EFFECTIVENESS OF WEAPONS SYSTEMS MAINTENANCE AND MAINTAINABILITY. TO MEET THIS OBJECTIVE THE AIR FORCE AND THE OTHER SERVICES ARE EXPENDING CONSIDERABLE RESOURCES IN DEFINING THE CONTENT OF MAINTENANCE TASKS, IN DETERMINING THE IMPACT OF EQUIPMENT DESIGN DECISIONS UPON THESE TASKS, AND IN STREAMLINING THE SELECTION AND TRAINING PROCEDURES FOR MAINTENANCE PERSONNEL. DEFICIENCY-PREDICTIVE MODELS OF MANPOWER PERFORMANCE EFFECTIVENESS IN THE AIR FORCE EXIST ONLY IN A FEW ISOLATED RESEARCH STUDIES AND/OR PARTICULAR SUBSYSTEMS, TASKS AND JOB CODES. OBJECTIVE-SPECIFIC PURPOSES OF THE RESEARCH ARE TO 1) FURTHER DESCRIBE A PREDICTIVE MODEL OF MAINTENANCE MANPOWER EFFECTIVENESS EXTENDING WORK INITIATED IN 1978. 2) GENERATE A DATA COLLECTION AND ANALYSIS SYSTEM WHICH AN AIR FORCE MAINTENANCE ORGANIZATION CAN USE TO EVALUATE ITS PERFORMANCE, AND 3) TEST THE DATA COLLECTION/ANALYSIS SYSTEM BY TRIAL APPLICATION AT TWO AIR FORCE BASES IN ARIZONA. HOW RESEARCH CONTRIBUTES-DEVELOPMENT OF A GENERALIZED AIR FORCE PREDICTIVE MODEL OF MAINTENANCE MANPOWER EFFECTIVENESS WOULD BE USEFUL FOR 1) INCLUSION IN LIFE-CYCLE-COST MODELS, 2) WING AND SQUADRON PLANNING OF MAINTENANCE ACTIVITY, 3) COMMAND EVALUATION AND IMPROVEMENT OF BASE AND WING PERFORMANCE, AND 4) DETERMINATION OF FUTURE CONCENTRATION AREAS FOR HUMAN RESOURCES RESEARCH RELATING TO WEAPON SYSTEMS EFFECTIVENESS.

APPROACH - 15 FEB 79

(U) THE MODEL IS DEPENDENT UPON CERTAIN MEASURES OF THE EQUIPMENT TO BE MAINTAINED, THE WORKING CONDITIONS, THE ORGANIZATION CLIMATE, THE TRAINING ATTITUDES AND MOTIVATIONS OF THE TECHNICIANS IN THE ORGANIZATION, THE SUPERVISOR RATINGS AND INSPECTOR RATINGS OF TECHNICIAN PERFORMANCE, AND THE ORGANIZATIONAL INTERFERENCES WITH MAINTENANCE ACTIVITY. THE RESEARCH WILL ATTEMPT THE DEVELOPMENT OF SUITABLE SCALES FOR MEASURING THESE SEVERAL FACTORS, AND IF THE FACTORS CAN BE WEIGHTED A GENERALIZED PREDICTIVE MODEL OF MAINTENANCE MANPOWER EFFECTIVENESS IS POSSIBLE THAT WOULD PROVIDE AN OVERALL SCORE FOR A MAINTENANCE ORGANIZATION AND AN INDICATION OF FACTORS NEEDING IMPROVEMENT.

PROGRESS-

PCN UB458-05163

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Perspectives on the Air Force Productivity
Program: An Outsider's View

Thomas C. Tuttle, PhD

Introduction

For the past nine months, I have been actively involved in a research project funded by the Air Force Human Resources Laboratory at Brooks Air Force Base entitled "Taxonomy and Codification of Hard Criteria for Evaluating Air Force Productivity Improvement Programs."¹

The primary objectives of this research are:

- (1) To review current and past efforts to define and measure productivity criteria
- (2) To evaluate and classify measures in terms of:
 - . practicality and cost effectiveness
 - . understandability and acceptability to Air Force managers
 - . psychometric properties (reliability, validity, etc.)
 - . relevance for Air Force organizations
- (3) To identify and systematize major groups of variables that have been shown to affect productivity
- (4) To develop a prototype methodology for generating organizational criteria and indicators

The information acquisition phase has been a tedious and time consuming undertaking involving four automated literature searches, extensive reviews of published bibliographies and published searches, manual reviews and gathering of "fugitive documents" through field visits and phone contacts. Thousands of references have been searched and approximately 300 books, journal articles, and technical reports have been selected for detailed review and inclusion in an annotated bibliography. Meetings have been held in individual and group sessions with over 150 Air Force, Army, Navy and Department of Defense people who are actively involved in some aspect of productivity enhancement or measurement. These interviews yielded over 40 hours of audiotape which is being reviewed and analyzed. As you can see, this project has generated a comprehensive data base which is now being "mined" for ideas and principles which hopefully will benefit ongoing Air Force organizational improvement efforts.

¹U.S. Department of the Air Force Contract No. F 33615-79-C-0019, with The Air Force Human Resources Laboratory Occupational Research Division; Brooks Air Force Base, Texas.

This afternoon I would like to share with you some observations and impressions that have evolved during this process. Hopefully, my comments will compliment those of others you have already heard, and will help to stimulate meaningful discussion in the working groups which will follow during this conference.

Although it is probably unnecessary with this audience, let me place our discussion in perspective by saying that productivity is not an Air Force problem, it's not a Department of Defense problem--it's a national problem. Consider the following statistics. From 1947 to 1967 our national productivity, output per man hour, grew at the rate of 3.2 percent per year every year. From 1967 to 1977 that rate dropped from 3.2 percent to 1.5 percent per year. In 1978 that rate dropped to less than one half of 1 percent. In 1979, although the final data is not yet published, the rate of growth, except for the fourth quarter, was negative--it actually declined.

This is significant. Consider for example that at a productivity growth rate of 3.2 percent, our standard of living approximately doubles in real terms in 22 years. This means that every generation finds the economic situation to be twice as good as their parents found it. That's been a part of our national dream, something that many of us have taken for granted. However, when the productivity growth rate is only 1.5 percent per year, it takes about 44 years for our standard of living to double--roughly two generations. At 0.5 percent per year, it takes 144 years! There's a big difference between 22 and 144 years. If we had still been realizing productivity improvements of 3.2 percent per year from 1967 on instead of what we did experience, the average real income of families in this country would be \$4,500 higher than it is today. I think we can see that we're not talking about abstract numbers. There are some real personal implications to all of us in this subject of productivity.

There's another side to this issue as well. It used to be that we could say that we're the most productive nation on earth and that these rates of improvement in Japan, France, Germany, and Italy don't matter because they've started out at such a lower base. That argument might have stood up ten years ago, but not today. We're twelfth among our major trading partners in terms of the rate of productivity growth. If current trends continue, by the end of the 1980's we will also be fifth in overall productivity. We will have been passed absolutely by Japan, Canada, France, and Germany. This has profound impact in terms of the value of the dollar. It also has profound implications for our defense posture, and the number of dollars we can spend on weapon systems when prices are escalating at an increasing rate. I think we will acknowledge that the strength of our nation is, in the final analysis, dependent on the strength of

our economic system. A healthy economy with an expanding economic base allows us to afford a first-rate defense establishment.

The important question facing us here today is how can we have any impact on the productivity of the United States? More specifically, how can we work to enhance the productivity of the segment we are most closely associated with--the U.S. Air Force? Of course, there are many things that need to be done at the national level: More incentives to encourage capital formation and investment, increased R & D emphasis, and more prudent, if not reduced, regulation. But there are also a number of important things that can be done by the people sitting in this room. We have to start within our own sphere of influence if we are to turn this problem around. We are all committed to this issue or we wouldn't be here today. But how should we proceed? In an effort to shed some light on this question, let me share with you some ideas and characteristics of successful programs that I recently heard in a speech given by Mr. Jeff Hallett (1979), Director of the Productivity Center at the Chamber of Commerce of the United States. My intent in drawing from the Chamber is not to imply that private industry solutions will necessarily work in the Air Force. But Jeff's perspective is broader than just private industry, having been Associate Director of the National Center for Productivity and Quality of Working Life and an observer of productivity initiatives in small business, large business, government and in other nations for the past seven years. These ideas represent his attempt to distinguish the characteristics of productivity programs that have worked from those that have failed. He proposes seven basic principles which characterize successful programs:

1. The top leadership of the organization is seriously committed to the improvement of productivity and makes that support visible.
2. Program goals and targets of improvement are clearly specified, and communicated to everyone in the organization.
3. Employees participate in setting goals and in other decisions affecting them. This insures high levels of visibility and employee involvement and insures that the human resources in the organization are fully utilized.
4. The organizations emphasize obtaining and using information about how the organization is perceived both by employees and those who use their products or services. This is a regular ongoing effort to pay attention to what people--the most important people in the organization's life--think about what's going on.

5. Anyone or any group in the organization that achieves notable success is rewarded, not only in terms of money but also in terms that generate pride, recognition and satisfaction.
6. Personal growth and development of people in the organization are considered a priority by the organization. Training programs are not instituted only to have people know how to operate a piece of equipment better or to more accurately complete reports. They are committed to the belief that the training process is more than imparting specific skills, it's also meant to insure that people who are in the organization are better equipped to contribute in a broader way to achieving the mission of the organization.
7. Finally, there is an active sharing of information about new methods, new innovations, new techniques or experiences that have generated improvements either inside the organization or outside. There is a mechanism for disseminating this information to all who could make use of the ideas.

According to Jeff Hallett, these are the key principles that underlie successful productivity programs.

Selected Research Evidence

Worker motivation research results provide some empirical support for certain of these principles. In a recent study by a colleague at the University of Maryland, Dr. E.R. Locke and his associates (Locke, et.al. 1979) reviewed over 85 field experiments testing various motivational strategies in terms of their effects on individual and group performance. Locke included only those studies which made use of the so-called "hard criteria" of performance. He argues that the motivational strategies that have been systematically investigated by industrial psychologists come down to some variant of four strategies: Goal setting, financial incentives tied to performance, job enrichment and worker participation. The results in terms of percentage improvements in performance appear in Table 1.

These results indicate that monetary incentives produce the greatest improvements in performance followed by job enrichment, goal setting and worker participation. When goal setting was combined with incentives, it yielded median improvements of 40 percent making this the most effective strategy. Since this

study focuses only on quantitative indices of performance, there is no way to tell if these gains came at the expense of other criteria such as quality, safety, absenteeism, scrap, etc.

Another systematic review of incentive management approaches (Hayes, Spector, and Fain, 1979) looked at the effects of incentive management strategies (rewards-for-performance). Based on a review of 51 case studies, these authors found an overall average improvement in performance of 22.8 percent (range - 9.7% to 35.7%) and from 20 of these studies which considered quality of performance, an average of 8.8 percent improvement in quality (range - 6.4% to 55.0%).

As both authors point out, attempts to aggregate research studies and draw meaningful conclusions must be interpreted with a great deal of caution. The Hayes et. al. study correctly points out that

"...under different circumstances, certain incentive plans are more effective than others in improving worker productivity and quality. Thus, incentive management must be tailored to the needs, requirements, and constraints of the targeted organization and job function." (1979, 4-10)

For our purposes, these results are presented to illustrate that there are known enhancement strategies which do work and these studies demonstrate the range of improvements which are possible.

Implications for the Air Force Program

What implications can we draw out of the foregoing discussion for Air Force productivity? First, let me say that it is not my intention, nor is it within the scope of work of my contract with AFHRL, to evaluate or critique the Air Force Productivity Program. However, during the many meetings and discussions that I have had with individuals involved in this program over the past few months, I have gained some impressions which I would like to share. While my experiences in this research have provided me with a rather unique perspective, my comments still should be viewed as one man's opinion.

Using Jeff Hallett's principles as the framework and the remarks provided by people I have interviewed as the raw data, I would like to highlight four areas of concern which might be addressed in this conference. These are four areas which I feel would have great payoff for the Air Force in terms of getting grass roots support for the program. These four areas are.

- . Support From Top Leadership
- . Clearly Communicated Goals
- . Rewards for Notable Success
- . Active Sharing of Information and Improvements

First consider support from the top. I don't have to convince this group that this is necessary for the success of any program. I'm also aware that efforts are underway to increase the existing top level support and to make existing support more visible to the field. From a field perspective, however, there does seem to be a perceived lack of sincere and continuing top management support for this program and it shows up in at least two ways.

Consider the following reaction to the productivity program

initiative: "When you get a big program like that, we start seeing things like Management by Objectives, the old Air Force Zero Defects, the RECON Program, PRIDE painted on all the hangars--it seems like all of these things coming together. None of these programs have been very effective nor have they worked very well. We saw ghosts of these old programs with productivity."

Similar reactions come from others who see productivity as just another program that's "hot" now but will go away in a couple of years. I hope and believe that is not true. But convincing the troops in the field will take some concerted efforts.

Another factor contributing to a perceived lack of top level support is this reaction to program introduction in general.

"We force programs onto our people in the field. We say here's a new program and you've got to support it. He says 'I need some people.' You say 'tough--you must take it out of your hide.'"

Others were even more direct. However, the fact that the productivity program has for the most part been added as an extra duty and has received no additional resources is evidence to the skeptic in the field--and there are some--that ~~there~~ is not a high priority program. This is particularly true in the absence of public comments by General officers to the contrary.

Some of you may take issue with my observation that ^{there} ~~this~~ is a lack of clearly communicated productivity goals. Here I am attempting to surface the issue of what productivity means in various types of Air Force units. More specifically, the issue, a familiar one to all of you, is what are the outputs of organizations such as a B-52 Squadron

or a Tactical fighter wing? Few of us are comfortable with the traditional input-output definition of productivity in those contexts. So, if we can't satisfactorily define productivity in these environments, how can we establish clear-cut goals?

Responses to this situation vary however. At one extreme is the view that "if you haven't found satisfactory indicators, you haven't done it right." At the other extreme is the position that "productivity has no place in the Air Force, at least not in the mission areas." Perhaps a more moderate view and one that I think is realistic says:

"Sometimes you finally have to say, you can't measure productivity in this organization. I want to scream as loud as I can--that's o.k. Let's not bug 'em any more to do it."

The question of whether the productivity program should be uniformly applied across all functional areas or selectively applied to those functions ^{where} ~~whose~~ clear cut measures exist and where goals can be defined is one that needs considerable attention. The principle of goal clarity suggests that by moving into areas where productivity is not yet clearly defined--the program may fail.

A third area of concern with respect to the Air Force productivity effort is that of the payoff to individuals and organizations for being productive. The following comment describes this dilemma for Air Force managers that is all too familiar:

"Nobody likes to issue their own report card every year saying how well they did. There's good reason for that. If a manager reports an increase in productivity, he's afraid that the guys in the budget shop are going to whack him in terms of manpower and dollars. If his report card doesn't show a productivity increase, he's afraid he's going to get slapped on the hands for being a bad manager and not being on top of his program. So he's damned if he does and damned if he doesn't."

This dilemma is depicted in the diagram in Figure 1. The two opposing forces produce a virtual standoff. In order to get positive movement, we need to beef up the incentives for managers to improve and at the same time reduce the forces operating against productivity improvement. The research data on incentives suggests that much can be gained through this approach.

The question of what's in it for me was raised in virtually every discussion I held. There are some efforts underway within the Department of Defense which do provide positive incentives for productivity. I think FASCAP can be viewed in this way. It cuts red tape and helps organizations get equipment they otherwise might not get. The Navy is experimenting with the payment of monetary bonuses to civilians who perform above standards. This is a small effort at present but has received a great deal of publicity all the way up to Congress. Some argue that productivity data can assist commanders at the MAJCOM level to justify major new programs in the PPRS Cycle. If one can show that resources have been used productively in the past, this should be a persuasive argument for additional resources in subsequent budget cycles.

The issue of how to increase incentives to individuals and organizations to be productive and perhaps equally important how to reduce disincentives to productivity is critical to the success of this whole effort.

A final area of concern is with the issue of information sharing. Certainly in a productivity enhancement effort one "should not reinvent the wheel." It has been my observation that most of the individuals working the productivity effort in the field both want and need guidance. It would be especially useful to have a central clearinghouse of information within the Air Force which could provide each base information on the most efficient methods and the latest technological breakthroughs in areas from solid waste disposal or repairing holes in a runway to laser welding or robots in manufacturing. Such a clearinghouse could also disseminate information on innovative management practices or other "success stories" that result from the efforts of various organizations. This activity could also be a central information source for resource materials, training materials, or publications which could assist productivity principals at the MAJCOM and base levels to carry out their productivity awareness and enhancement functions more effectively. This would put some productivity selling and enhancement tools in the hands of field personnel and would be welcome.

Summary

The main points I have tried to address this afternoon are the following:

- 1) Productivity is a serious national problem which, if present trends continue, threatens our economic health and our security.

- 2) There are things that we can do within our own spheres of influence to improve this situation.
- 3) Both personal observation and research data point to some basic principles that characterize successful productivity programs.
- 4) The Air Force productivity program can be greatly strengthened if:
 - a. There is increased top management support.
 - b. Areas of applicability of the program are defined and clear goals are established.
 - c. Incentives are found or developed which reward productive individuals and organizations and disincentives to productivity are reduced.
 - d. A mechanism is developed to collect and disseminate information on productivity successes, technological innovations, and available educational or training resource material.

If an appropriate organizational context is established, I am convinced that the people working in the field with Air Staff support will resolve the technical questions associated with defining, enhancing, and evaluating productivity. I have been enormously impressed by the competence and dedication of the people I have met. But a receptive climate is essential. It is my hope that the working sessions which will follow later today and tomorrow can begin to address ways in which this receptive climate can be created.

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TABLE 1
PERFORMANCE CHANGES THROUGH MOTIVATION

<u>MOTIVATIONAL STRATEGY</u>	<u># STUDIES</u>	<u>MEDIAN PERFORMANCE CHANGE</u>	<u>RANGE</u>
GOAL SETTING	17	16.0%	2% - 57.5%
MONEY - INDIVIDUAL PIECE RATE	10	30%	3% - 49%
MONEY - UNSPECIFIED INCENTIVE PLANS	7	39%	25% - 75%
PARTICIPATION	14	0.5%	-24% - 47%
JOB ENRICHMENT	13	17%	- 1% - 63%
GOALS OR STANDARDS PLUS INDIVIDUAL INCENTIVES	13	40%	10% - 65.3%
GROUP INCENTIVE PLUS PARTICIPATION	7	16%	6% - 68%
GROUP BONUS	4	27.2%	11.2% - 50%

IMPROVING PRODUCTIVITY OF HIS UNIT:

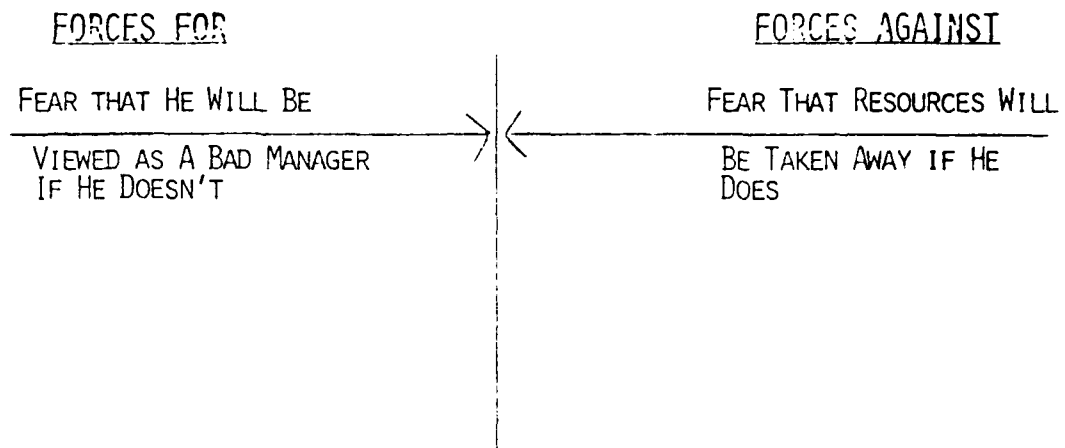


FIGURE 1

AIR FORCE MANAGER'S PRODUCTIVITY DILEMMA

Development and Evaluation
of the
Organizational Assessment Package

Lt Col William H. Hendrix, USAF

DEVELOPMENT AND EVALUATION OF THE ORGANIZATIONAL ASSESSMENT PACKAGE

This presentation focuses on the development of the Organizational Assessment Package (OAP) which was designed to be used by the Air Force Leadership and Management Development Center (LMDC), Maxwell AFB, Alabama in their management consultation role. The LMDC mission includes (a) providing consultative services to Air Force commanders, (b) providing leadership and management training to Air Force personnel in their work environment, and (c) performing research in support of (a) and (b). The consultative role involves organizational problem area identification and recommendations for reducing or eliminating problems identified. The OAP was designed to meet the mission objectives of LMDC. First, the OAP provides a means of identifying existing strengths and weaknesses within organizational work groups and aggregated work groups, such as directorates. Second, research results can be fed back into their Professional Military Education; other leadership and management training courses; and when action is required, to Air Staff and functional offices of primary responsibility. Lastly, the OAP data base established can be used for research to strengthen the overall Air Force organizational effectiveness program.

BACKGROUND

Preliminary development of the OAP was accomplished by the Air Force Human Resources Laboratory (AFHRL) using a contingency model of organizational effectiveness. This model (Figure 1) previously reported by Hendrix (1976) considered Organizational Effectiveness (E) to be a function of the criterion selected (c), the managerial style employed (m), and the situational environment (s) which includes the manager's subordinates, peers, and other personnel in the environment.

Insert Figure 1 About Here

The Organizational Assessment Package (OAP) was designed to measure the basic components of the Three Component Organizational Effectiveness Model. As can be noted in Figure 1, the Supervisor Inventory (SI) was designed to measure managerial style (m), while the situational environment (s) was to be measured by two sections of the OAP, the Background Information section, and the Job Inventory (JI). The criteria selected included satisfaction, organizational climate, and perceived productivity. These were to be measured by the sections entitled: Job Satisfaction Questionnaire (JSQ), Organizational Climate Inventory (OCI), and Perceived Productivity Inventory (PPI).

Each section or module of the OAP was designed to be administered separately or as a part of the total package. This provided consultants with additional flexibility. For example, they could administer the total package in a pre-test, identify a specific problem area, provide an intervention program to solve the problem, and then posttest using only the OAP module dealing with the problem area. On the other hand, if an organization desired only that one area be diagnosed then consultants could use one or more OAP modules to assess characteristics of the problem area instead of using the total OAP. This would save time in administering the instrument and therefore employee time away from the job would be decreased.

LMDC and AFHRL initiated the cooperative development of the OAP after a feasibility workshop held at Maxwell AFB. The first instruments used by LMDC were mini-surveys which provided consultants with 12-18 questions which they could administer and manually calculate item indices. Eventually LMDC requested AFHRL to develop the OAP for use by LMDC's management consultants in order to provide a comprehensive assessment instrument. The efforts that resulted involved a team approach during which LMDC collected data using the OAP for validation purposes as well as for survey feedback and AFHRL validated the OAP and provided OAP computer summary data for each installation surveyed. The critical events during this period included: (a) formation of a management consultation R&D Team - June 1977, (b) OAP Validation - July 1977-July 1978, and (c) operational implementation - September 1978.

VALIDATION

Subjects

A sample of 4786 military and civilian subjects was collected at five Air Force bases representing six major commands. The sample's composition was: two percent nonhigh school graduates, 39 percent high school or GED graduates, 37 percent some college work; nine percent bachelor degrees, six percent some graduate work, six percent masters degrees, one percent doctoral degrees; 78 percent white, 10 percent black, five percent hispanic, seven percent listed as other than white, black or hispanic; 86 percent males, 14 percent females; 17 percent officers, 66 percent enlisted and 17 percent civilians.

Survey Instrument

A group of 149 attitudinal items and 16 background information items were included in the OAP developed for validation. The attitudinal items were either seven-point Likert scales with no response option for not applicable responses or eight-point Likert scales with a zero point for not applicable responses. Scales used included: agree-disagree, extent, amount, and satisfaction scale response anchors. The attitudinal items were selected to measure the major components of the contingency model; namely, the manager or supervisor, the situational environment which dealt primarily with the job, and three criteria of effectiveness (i.e., satisfaction, climate, and perceived productivity). Within the situational environment, items were constructed specifically to measure the

components of the job enrichment model described by Hackman, Oldham, Janson, and Purdy (1975) as well as other job related components. The basic unit used for analysis was the work group which was defined as any group of individuals performing work under a work group supervisor/manager.

RESULTS

It was considered desirable to have inventories which measured factors which were unique to the given inventory. That is, items in one inventory should load only on factors of that inventory and not load on another inventory's factors. In order to accomplish this objective all 149 attitudinal OAP items were factor analyzed using a principal axis solution with orthogonal rotation. Those items loading on factors in more than one section were either deleted or if the loadings were very high for factors in one section and lower for factors in another section then they were kept with the section having the high loading factor. Next, each inventory was factor analyzed using a principal axis solution with orthogonal rotation. Table 1 lists the 22 rotated factors extracted by OAP inventory section.

Insert Table 1 About Here

Once the OAP factors were isolated the next analysis involved developing regression equations to predict the scores for Job Related Satisfaction, Perceived Productivity, General Organizational Climate, and Organizational Communications Climate factors. These factors normally would be derived from the Job Satisfaction Questionnaire, Organizational Climate Inventory, and the Perceived Productivity Inventory. By developing prediction equations using Job Inventory and Supervisor Inventory variables then one could predict the other factors without administering the inventories associated with the factors. This, of course, provides the consultant with additional flexibility. If a manager insists on a small survey, then the OAP can be reduced to include only the Job Inventory and the Supervisor Inventory and estimated factor scores be developed for the remaining inventory factors. Table 2 lists the R^2 values indicating the variance account for using the prediction equations.

Insert Table 2 About Here

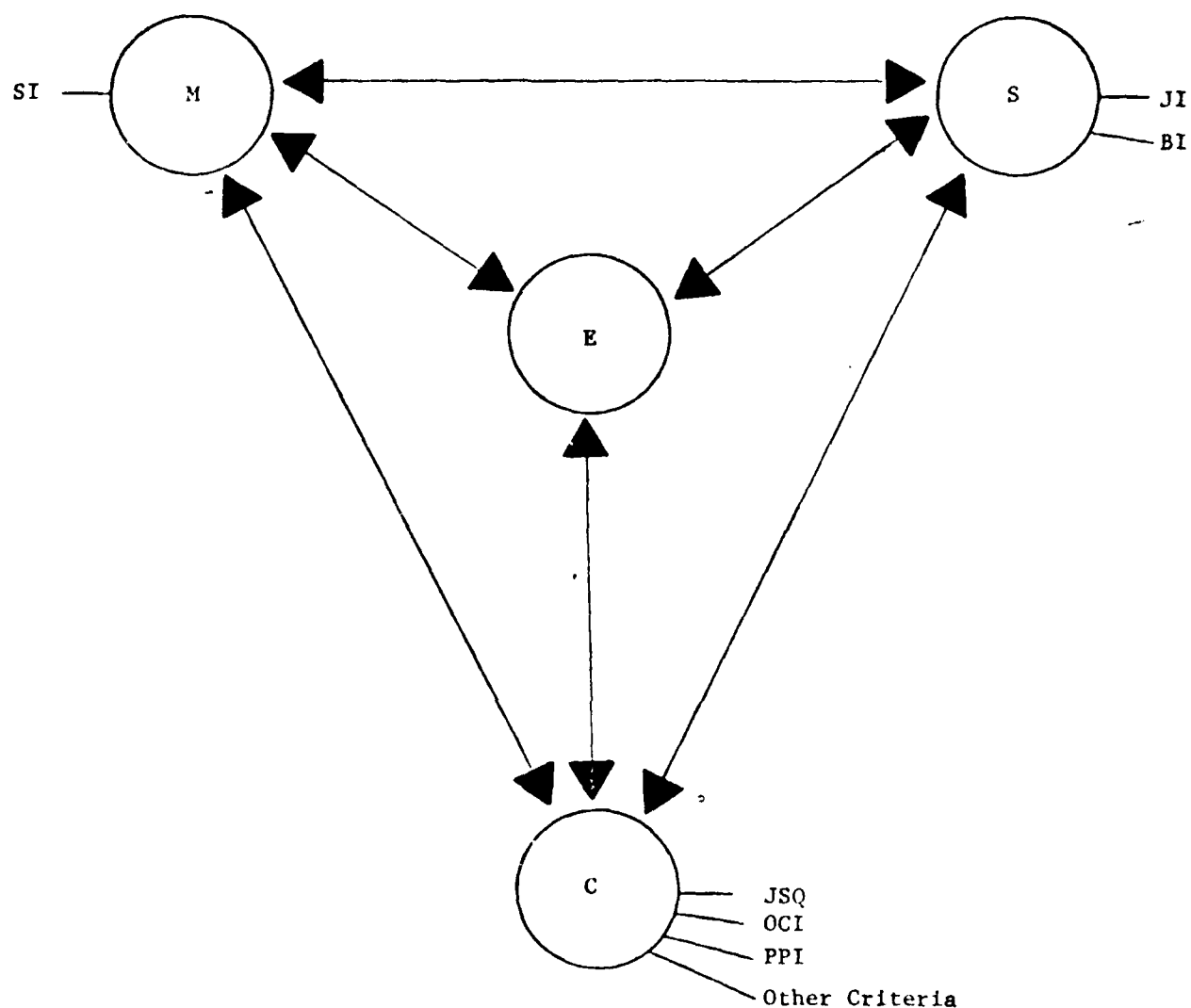
FUTURE DEVELOPMENTS

Future uses of the OAP include relating OAP climate indices with blood hormones which have been found to be related to stress and coronary artery disease. Also, TAC is interested in using the OAP to see if OAP indices can be related to pilot performance differences across various units.

Future OAP developments include development of improved OAP inventories which is presently underway at the Air Force Institute of Technology (AFIT), where the principle AFHRL OAP developer has been reassigned. To date an expanded Supervisor Inventory has been developed and data collected for analysis. Presently, the Job Inventory is being expanded. Once completed these instruments should provide an even more comprehensive assessment package for management consultants.

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Legend:

M = Management Style
SI = Supervisory Inventory

S = Situational Environment
JI = Job Inventory
BI = Background Information

C = Criterion
JSQ = Job Satisfaction Questionnaire
OCI = Organizational Climate Inventory
PPI = Perceived Productivity Inventory

Figure 1. Three Component Organizational Effectiveness Model

TABLE 1
OAP Inventories' Factor Analyses

Factor	Description	Items with Loadings > .25	Loading Range	Percent Total Variance	Unrotated Factors Eigenvalue	Items Loadings Related	Consistent Alpha
Job Inventory (Part 1)							
Job Enrichment	Feelings of pride and self-worth, job significance, talent and skill variety.	10	.49 - .73	12.24	13.61	10	.87
Task Autonomy	Job freedom and independence.	7	.35 - .79	6.34	2.57	4	.84
Planning and Time Management	Short and long-term planning, use of Management Information Systems.	9	.35 - .80	6.82	2.24	9	.76
Supervisor Influence	Supervisor asks for ideas, encourages teamwork, provides assistance.	8	.31 - .77	7.33	2.03	8	.80
Advancement/Recognition	Prepared for Career Progression and increased responsibility, aware of promotion opportunities.	4	.46 - .80	4.95	1.63	4	.75
Work Group Performance ^a	Work groups perform under pressure, ability to solve problems effectively.	7	.30 - .74	5.90	1.32	7	.61
Equipment/Work Space/Goal Clarity ^b	Adequacy of tools, equipment, work space. Goals clear and specific.	6	.30 - .74	3.95	1.17	2	.55
Work Repetition	Performs task repeatedly, faced with same problems, tasks easy to perform.	3	.47 - .81	4.11	1.11	2	.71
Goal and Skill Accomplishment/Task Variety ^c	Goals difficult to accomplish, interference from additional duties. Job requires number of complex skills.	7	.31 - .64	4.06	1.05	7	.64
Job Inventory--Need for Enrichment (Part 2)							
Meaningful/Responsible Work	Need to use skills, perform variety of tasks, have personal growth.	8	.66 - .87	49.17	5.04	5	.92
Desired Repetitive/Easy Tasks ^c	Need for repetitive job with easy tasks.	2	.83 - .86	15.92	1.45	2	.64

TABLE 1 (Cont)

Supervisor Inventory							
Management Supervision	Supervisor is a good planner, establishes good work procedures, takes his responsibility clear.	10	.67 - .77	30.56	22.36	8	.94
Supervisor Feedback	Supervisor helps me to improve performance, provides feedback to help me improve performance.	10	.62 - .76	26.51	2.16	4	.91
Autocratic Control	Supervisor over controls work, overemphasizes work accomplishment.	8	.29 - .69	5.55	1.14	4	.58
Organizational Climate Inventory							
General Organizational Climate	Organization has interest in people and rewards performance. People are proud of organizational climate and are motivated.	10	.62 - .76	33.56	12.22	10	.93
Organizational Climate	Organization provides job information, data on important events. Information is widely shared.	10	.44 - .86	24.62	1.16	5	.89
Perceived Productivity Inventory							
Perceived Productivity	Productivity is high in this organization.	5	.71 - .83	43.82	3.08	5	.82
Productivity	Productivity is high in this organization.	2	.77 - .78	17.51	1.22	2	.34
Job Satisfaction Questionnaire							
Job Satisfaction	Job satisfaction is high in this organization.	10	.42 - .75	21.13	7.30	10	.66
Job Satisfaction	Job satisfaction is high in this organization.	7	.33 - .81	11.39	1.74	2	.63
Job Satisfaction	Job satisfaction is high in this organization.	10	.29 - .80	12.88	1.07	2	.71
Job Satisfaction	Job satisfaction is high in this organization.	3	.71 - .86	10.35	1.03	3	.74

At factor analysis variables listed here loaded on factor in Supervisor Inventory.

Additional variables recommended for inclusion. Additional variables not recommended for inclusion.

This factor is weak in terms of internal consistency. Should this factor be included, additional items to strengthen it is recommended.

TABLE 2
Job Inventory and Supervisor Inventory Regression Analyses

Analysis Number	Inventory	General Organizational Climate	Organizational Communications Climate	Job Related Satisfaction	Positive Perceived Productivity
1-4	Job Inventory	.52	.24	.52	.43
5-8	Supervisor Inventory	.42	.19	.27	.30
9-12	Job and Supervisor Inventories	.57	.30	.55	.47

On the Necessity For Models to Evaluate Planned
Organizational Change

Edward J. Conlon, PhD

On The Necessity for Models to Evaluate Planned Organizational Change

Edward J. Conlon, Ph.D.
College of Management
Georgia Institute of Technology

Abstract

This paper discusses the necessity of having models of expected effects prior to evaluating programs of change in organizations. Models are discussed in view of their impact on the information yielded by a study, the generalizability of results and the susceptibility of the findings to misinterpretation. A broad outline is then provided of those factors which are likely to affect the outcome of planned change efforts. Specific reference is given to the Air Force LMDC program.

A distressing shortcoming of many evaluations of planned organizational change programs is the failure of evaluators to carefully conceptualize the effect of the program prior to evaluation. A possible reason for this is that there are, to date, no theoretical models of sufficient detail from which to develop a situation specific model of a planned change program. The object of this paper is to argue for the necessity of such models when evaluating programs such as the United States Air Force Leadership and Management Development Center's (LMDC) program, and then to broadly outline the likely structure of such a model.

In the present context, the term planned organizational change refers generally to specific attempts to alter individual and/or group behavior to enhance organizational effectiveness. The general class of Organizational Development programs (cf. Alderfer 1976; Friedlander and Brown, 1974) would belong in this class. The idea that models increase knowledge yield, however, is not constrained to programs of behavioral change and applies equally well to technological and structural changes.

The Value of Models

An evaluation study of planned organizational change is research intended to ascertain the affects or outcomes of an implied or expected change in an organization's functioning. As such, it falls in a class of studies typically referred to as "Evaluation Research" (cf. Cook and Campbell, 1979). Generally, the intent of research of this type is to answer the question "(I)s a program effective(?)" where the concept of effectiveness is translated into the set of criteria and measures used by the evaluator to assess the program.

The concept of model concerns how the evaluation researcher portrays the relationship between the program being evaluated and the criteria selected. The contention of this paper is that the scientific and practical yield of an evaluation study is maximized by careful attention to the construction of a model relating the program to each criterion measure. At the risk of stereotyping evaluation research a "typical" evaluation study will be used to illustrate the value of careful modeling.

Suppose an organization is interested in evaluating the effectiveness of a training course in "communication skills" that has been offered to supervisors of work groups in a certain division. Aside from the usual research design issues faced in such studies, a major question the evaluator faces is what measures to use to evaluate the course. At this point it becomes clear that all research requires a model. The issue is that the model selected greatly determines what one can know from the results of the study. At one extreme is the researcher who simply selects a variety of immediate target variables to conduct the evaluation. In our example, these might include changes in the (1) amount of communication, (2) the number of miscommunications, (3) the quality of memoranda produced, (4) satisfaction with communicating and (5) attitudes toward communicating. The proposed model, which is labeled the "naive" model, may be used to illustrate several points.

First, the selection of measures in the naive model limits the knowledge yield to whether or not the program affects the immediate target variables. No further inferences can be made. This model is distinctly dissatisfying in the event that the communication course was instituted with the expectation that improved communication would facilitate productivity, hence group performance. The point is that the model and selection of variables should include all assumed effects if the yield of the study is to be maximized.

A second issue concerns the internal validity of the model (Campbell and Stanley, 1966). The naive model implies that the relationship between the program and the criterion variables is static across all situations in the sample. For example, it implies that the impact of the course would be the same for groups with routine, programmed tasks as for those with complex, unprogrammed tasks. Similarly, the naive model does not account for individual differences in supervisors in their response to the course. If the static assumption is incorrect, then the model is not valid and the results may be misleading. For example, if task moderates program effectiveness, then an overall result (i.e., one disregarding task) from the naive model which indicates that the program was ineffective might mask dazzling success in groups with one task type, and dizzying failure in the others. The policies which result from the research, then, would be misinformed.

A third question concerns the generalizability or external validity of the model (Campbell and Stanley, 1966). Put more vividly, does the model generalize to circumstances or situations outside of the target population?

To some extent, this issue is strongly related to the former issue of internal validity. The value of a model in this sense is to classify situations according to the validity or viability of the model; that is, the model predicts where the program will be effective and where it will not within the range of situational variables it encompasses. The external validity of a model cannot be assessed, without further research, for models like the naive one where situational boundaries are not included.

Another question concerns the information yield of the model, particularly about why the program succeeds or fails. It is useful, where practical, to include in a research model intermediate indicators of the process through which the program is implemented. In the example, the evaluator might have assessed the degree to which the communicators attempted to implement techniques learned, factors leading to difficulty in implementation, initial responses to implementation efforts and so forth. The information yielded by such "process tracings" is often useful for diagnosing failures and re-designing programs.

Finally, a discussion of the value of a model would be incomplete without a mention of the problem of spurious correlations (Simon, 1971). Suppose that our evaluation was not so naive and instead of limiting criteria to a small set of target measures, cast a much larger net of indicators. The use of such a net, as might be obtained from a standardized instrument like the Organizational Assessment Package (Hendrix and Halverson, 1979), would still fail to guarantee valid interpretations of program effectiveness. Without a model linking the program to specific indicators, the temptation is to look for relationships (e.g. product-moment correlations) between the program and the net. By chance some of these correlations would be expected to be significant while others may be significant through paths unanticipated and unknown to the evaluator. For example, societal fertility rates are significantly correlated with societal milk consumption. Does one conclude that milk consumption causes fertility? One would probably not have a theoretical reason (i.e., a basis for a a priori model) for such a relationship to exist. The point is that spurious correlations if used to induce a model posthoc may foment incomplete or incorrect models. Valid use of the hypothetical deductive approach to research demands hypotheses prior to data analysis (Kaplan, 1964).

In summary, we have argued for the careful formulation of research models prior to the evaluation of programs. Unfortunately, reviews of the research in the area of planned organizational change reveal a lack of such concerns (cf. Goodman, Conlon and Bazerman, 1980; Alderfer, 1976). The result is a body of findings with questionable internal validity, no generalizability and less than optimal knowledge yield. The time is ripe for the development of models to guide evaluations of organizational change programs. The remainder of this paper outlines some considerations in that regard.

Elements of a Model

There are four general components of planned change efforts that have an effect in nearly every setting. These are: (1) Intervention characteristics, (2) Situational moderators, (3) Non-performance or intermediate outcomes and (4) Performance outcomes. Figure 1 places these components in relationship to one another and outlines some aspects of each.

Intervention Characteristics -- These are aspects of the change itself which both define the expected outcomes (i.e., goals) of the planned change effort and affect the probability that these and/or other outcomes will be achieved. A distinction may be made between the content and process of an intervention. Content refers to the objectives of the change, the information used to bring about change (e.g. the message) and the vehicles used to bring about change. The latter attribute, vehicle, has been used to classify types of organizational change. One distinction that several classifications of planned change have employed (Leavitt, 1965; Friedlander and Brown, 1974) is that between "Human Relations" and "technostructural" approaches. There need not be any difference in goals between these two approaches, but the vehicle used to achieve the goals is very different. Human relations approaches seek goal attainment by altering the nature of relationships (e.g. sentiments, communications) among individuals. This is often accomplished through varieties of interpersonal skills training. Technostructural approaches affect organizational goal attainment through alterations of reward systems, authority, formal reporting relationships, decision making practices and other elements of technology and structure. Content is important in that it largely determines the intermediate and final outcomes which should be assessed. For example, some intermediate outcomes of a human relations type intervention might be interpersonal behaviors, work attitudes and satisfaction with groups. Those for a technostructural change might include measures of role overload, beliefs about a new reward system (i.e., how one gets rewards) or perceptions of ambiguity about power and authority.

In contrast, process concerns how changes are implemented rather than what those changes are. For example, research has shown that changes that develop in a participative fashion are more likely to be implemented and persist than those that are unilaterally imposed (Locke and Schweiger, 1979). Aspects like participation, the training media used (eg. on the job versus classroom), whether the change is focused at individuals or groups and so forth, are process distinctions that can affect the probability that the change will succeed.

Evaluations of planned change efforts should consider both content and process distinctions. In the case of the LMDC evaluation, the goals of the particular consultant and the way in which he/she implements those goals may be a critical aspect of whether the affected unit improves. A complete understanding of the causes of success or failure in the LMDC project, which could be essential for future policy making with regard to manpower development in the Air Force, may not be possible without the inclusion of intervention characteristics in the evaluation design.

Non-Performance Outcomes -- These are results of the intervention which are not performance, per se, but may nonetheless be important as final outcomes (eg. morale) or may be construed as intermediate steps to final performance outcomes (eg. organizational climate, task perceptions, etc.). The selection of non-performance outcomes, of course, depends on the type of intervention and should be tailored, to some extent, to intervention characteristics. A problem with the behavioral science literature on change is that, often, intermediate outcomes are the major focus of evaluations (cf. Golembiewski and Carrigan, 1970a, 1970b). It should not be assumed that performance always results from attainment of intermediate objectives.

Performance Outcomes -- These are changes in individual group and/or organizational effectiveness. Generally the choice of level of analysis depends on the task. For example, it is probably the case that group performance is the most relevant for a bomber wing because task effectiveness involves the coordinated effort of multiple individuals. This may not be the case for a computer programmer.

Like many private sector organizations, defining productivity for the Air Force is often difficult because of a lack of easily measurable output. In such cases, it may be more appropriate to use a systems resource approach (Yucklman and Seashore, 1967) in which the inputs become relevant. One might also develop perceptual measures which could be applied to incumbants of the evaluated unit or personnel who interface with that unit. This author and his associates have discussed such problems in detail elsewhere (cf. Connolly, Conlon and Deutsch, 1980).

Situational Moderators -- Finally, there are a variety of factors external to the intervention itself which may affect the probability of success. These factors account for the finding that the same intervention may vary in effectiveness across various units of a single organization. Unfortunately, there has not been a great deal of research on such moderators. One factor that has been examined is resistance to change (Coch and French, 1969; Lawrence, 1969) which may moderate intervention effectiveness. In the Rushton Quality of Working Life Study (Goodman, 1979), it was clear that work groups varied in their willingness to accept change. Some determinants of willingness are the mean length of service of individuals in the unit, the perceived impact of the change on factors like status and effort, the presence of opinion leaders who are unfavorably disposed to change (perhaps because of threats to status) and the relation of the change to the attainment of member goals and motives. Other situational moderators may be the presence of visible success models (eg. other units who have successfully changed), task differences and subunit climate. Again, understanding success and failure of change requires a consideration of such moderators when evaluating programs.

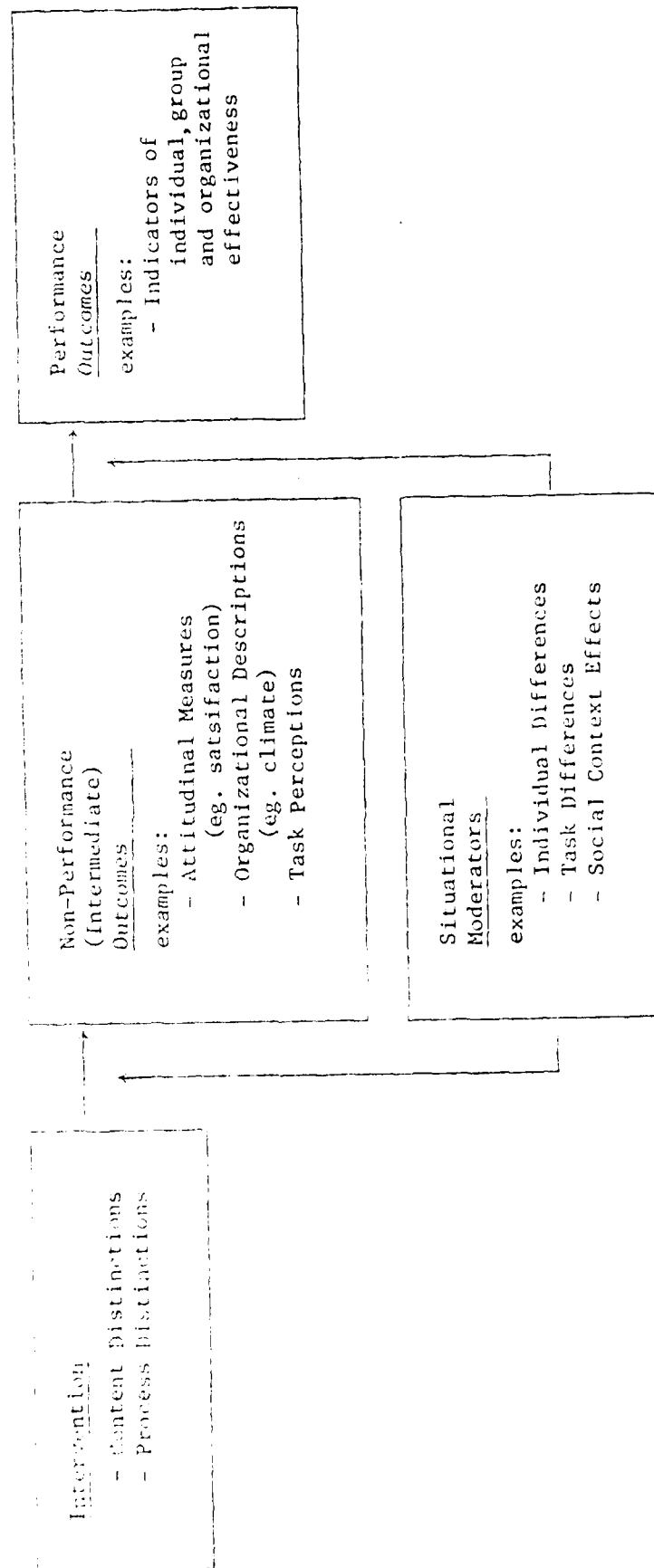
Model Dynamics -- The general framework presented here suggests that any analysis of planned change efforts is a multivariate endeavour; that is, success or failure will not be understood on the basis of one or even several variables. The efficacy of any intervention depends on how well its content and process fits the situation at hand. All of this points to the need to understand the process of how change is adapted and persists. The present model suggests that the relationship between any intervention and

performance outcomes is dependent on the attainment of intermediate outcomes, which usually involve changes in individual behavior, and may be sensitive to situational differences. The only way to understand such complexity is to carefully model the situation prior to the evaluation and to collect data on those factors which are deemed most likely to affect success. The use of a standardized measure like the OAP provides a broad based measure of potential outcomes and moderators, but should not be expected to cover all situations or to consistently expose the same interrelationships among factors across all organizational subunits. In short, different situations imply different models, hence different hypotheses.

In summary, the LMDC evaluation is not a particularly manageable research endeavour. A thorough understanding of program effectiveness will require intensive thought and data analysis. The payoffs, however, could be large in terms of benefits to the organization and, very importantly, to our conceptual understanding of the organizational change process.

Figure 1

Components of a Model for Describing
Planned Change Efforts



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The USAF Management Engineering Program

Briefer

Col Claude S. Dodd, Jr., USAF

20 Feb 1980

AIR FORCE MANAGEMENT ENGINEERING AGENCY
Randolph AFB TX 78148

OFFICE OF THE CHIEF, Standards Development Division

MEMORANDUM FOR: MPMZ - Capt Crawford

Fred,

Briefing slides & narratives from the Productivity Symposium are attached.

An item of clarification - The last topic on the slide entitled Special projects of interest is "Standards Development Concept."

This concept is discussed in the narrative (highlighted). The last slide in the package lays out the process by phase.

If I can assist further, please call.

CLAUDE S. DODD, Jr., Colonel, USAF
Chief, Standards Development Division

THE AIR FORCE MANAGEMENT ENGINEERING PROGRAM

Chart #1 - Organizational Header

Chart #2 - Background

Since 1959, the hub of the Air Force Manpower Management Effort has been the Air Force Management Engineering Program. The Air Force MEP is designed to determine the most valid manhour-to-workload relationship. This ensures equitable distribution of required manpower resources by grade and skill, with the focal point of having the right numbers of authorizations at the right place, at the right time for mission accomplishment. The program is operated by specially qualified and trained personnel assigned to management engineering teams located at major Air Force bases throughout the world. These teams define work tasks, measure the time required to perform them and then develop the manpower standards that become the mathematical tools used to compute manpower requirements.

Prior to 1974, Air Force manpower standards were developed using what was called a lead command/lead team concept. Under this concept, the Air Staff selected a lead command and a lead management engineering team within that command to develop an Air Force standard for a particular functional area. Once selected, the lead team familiarized itself with the function and developed a measurement plan. This plan was used by other selected command input METs throughout the Air Force to measure the function. After the data was collected, the lead team then analyzed the data and developed a manpower standard.

Chart #3 - Quest for Improvement

In 1973, an Air Staff Directorate of Manpower and Organization Study Team completed an in-depth study of the MEP. The team found the percentage of manpower standards coverage for the total force had become fairly static and the time required to develop a manpower standard quit showing any significant decrease. The system was not paying enough attention to keeping standards current; the MEP encountered difficulty in producing the same standard of living among the various commands; and the program could not sustain functional expertise. The study team recommended testing a Functional Management Engineering Team (FMET) concept. A FMET would dedicate its total time and energies to a single function; for example, the personnel community, as opposed to being responsible for all functions existing at their physical location.

A test of the concept in 1974 proved that the concept was not only feasible but desirable. The major benefits noted were: The FMET was able to provide better service to the Air Staff OPR and response time was improved. The Air Staff Functional Manager expressed a higher level of confidence in the MEP.

A centralized point of control was needed for the functional METs. The three major reasons are; (1) functional METs provide service across the Air Force so no single command should have an undue influence; (2) the functional MET needs to be totally dedicated to its assigned functions and; (3) common direction is needed to insure that the efforts of the functional METs are consistent. This led to the activation of AFMEA on 1 Nov 1975.

In 1978, the Air Staff reorganized and the directorate of manpower and organization became a directorate under the DCS for manpower and personnel. Effective 30 June 1978, AFMEA was assigned as a named unit to AFMPC with HQ USAF/MPM providing technical direction.

AFMEA, with its 11 functional METs, located at various installations throughout the Air Force, has 346 authorizations. The MAJCOMs still have their own Management Engineering Program developing command standards as well as providing the arms and legs for Air Force Standards Studies. There are currently 16 reporting MAJCOMs and SOAs with 146 individual base Management Engineering Teams. Total authorizations for the command headquarters and base METs are 2573.

Chart #4 - Mission

The mission of AFMEA consists of these major responsibilities:

The primary responsibility is the management of the Air Force Management Engineering Program which includes development and maintenance of manpower standards for major common functional areas.

AFMEA serves as a focal point for developing zero-based manpower requirements and programming tools used in the budget process. The agency is also charged with addressing functional issues which may impact these requirements.

In wartime manpower planning, we want to include wartime manpower standards development in the regular MEP process. We need more adequate functional guidance in this area and as it is obtained, we will develop procedures and methodology for developing wartime standards in the MEP's regular process.

AFMEA's responsibilities in productivity include developing the Air Force input for the annual Federal Productivity Report. We also provide assistance to Air Staff Functional Managers regarding the Air Force Productivity Program, to include developing productivity measures. The agency manages and administers FASCAP and Joint Productivity Councils.

AFMEA's grades management charter is to analyze and review current and past trends in grade allocations to establish procedures for an equitable distribution among commands for future allocations. AFMEA also administers and acts as secretariat for the annual career requirements review board which prioritizes Colonel requirements Air Force-wide.

AFMEA's final major responsibility is conducting applied research for manpower management. This includes developing and maintaining the manhour availability factor for the military and civilian force and other research as approved by the director of manpower and organization.

Chart #5 - Special Projects of Interest

Project Total Manpower Requirements and Resources (TOMARR) modifies current manpower data systems to provide the capability to record, process, and report all categories of Air Force manpower. TOMARR, started in Dec 1978, will be implemented in two phases, with the first phase being implemented in Mar 1981. At this time, there is not a firm date for implementing the second phase.

The Engineer Requirement Study is to determine and document the total Air Force engineering requirement. The study started in Jan 1979 and is due to be completed in Aug 1980. Presently the study plan is being coordinated with study participants prior to submitting it to the Air Staff and AFMPC/CC for formal approval. Upon completion, this study will provide a statement in percentage of total authorizations of the engineer/engineer technologists requirement and a programming tool to keep the statement of requirements current.

The third project, Manpower Analysis Requirements for System Acquisitions, is to develop improved manpower analysis procedures for systems in acquisition. Current policies and procedures have been clarified and new ways to improve manpower analysis during the system acquisition process have been identified. A regulation is now being written that brings together all existing, as well as proposed, policies and procedures for better manpower involvement in the acquisition process.

The Standards Development Concept Project is a fresh, new look at the way the MEP develops standards. The objective is to get smart earlier, increase the functional OPR involvement and commitment while, at the same time, encouraging productivity improvements based on potential benefit to the Air Force. We want to maintain credibility and quality of the MEP but yet increase responsiveness and service to Air Force functional managers. We intend to test the concept in early 1980.

Chart #6 - Manpower Standards Studies

This chart shows several items. First, is the number of standards that the Air Force MEP has developed, those we consider to be current, and the impact on the Air Force manpower strengths. Differences between the number of standards developed and the number of current standards are attributable to removing obsolete standards from the inventory. Obsolescence is caused by mission changes, organization changes, procedural changes, equipment changes, etc.

Relative to scheduled and planned studies as of Dec 79, there were 268 on-going and programmed management engineering studies covering some 257,090 manpower authorizations.

Although our goal in AFMEA has been 100% manpower standard coverage, the dynamics of a constantly changing Air Force prevent us from accomplishing that goal, as evidenced by the 62.6% figure. However, we will continue to study those areas where standards presently do not exist or have become obsolete, but in doing so, we believe a goal of 80-85% total coverage is more realistic and attainable.

Chart #7 - Long-Range Objectives

The goals listed on this chart, when achieved, will significantly enhance the management of Air Force manpower resources and make the MEP more responsive to changing environments.

It currently takes approximately 66 weeks to develop a manpower standard. This is excessive. Even though we are exploring a new concept to help reduce that time, we want to continue to innovate procedures to enhance standards development response time. We very much want to look at each function before a study and recommend changes to procedures, methods, organization, etc., which will increase their productivity so that our measurement will reflect the most effective operation.

We will continue to fine tune procedures for grade and skill determination to provide the optimum requirements.

We need to provide better tools for managers to use in programming manpower requirements. We will continue research on techniques to accomplish this objective as in our Data Automation system. We intend to continue enhancements of the manpower standards development automated systems and to place more emphasis on developing an automated system to apply standards once they have been developed.

In the wartime arena, we need procedures and policies which will ensure that our wartime capability is adequately stated.

And finally, using all the tools available, we need to provide the Air Staff with an annual zero-based total requirements package for the budget process.

Chart #8 - Conclusion

Like all programs within the Air Force, the MEP has been reviewed by agencies within the department as well as by agencies external to the department. Internally, it has been reviewed by our Inspector General, Auditors, etc., and it has been looked at by external agencies such as the General Accounting Office. Regardless of the yardstick used to evaluate the MEP, it has been rated a categorial success, as evidenced by the comments made by HR Armed Services Committee shown in this last chart.

We intend to keep the Air Force in the forefront of manpower management in the present and future.

This concludes my briefing. If you have any specific questions concerning the MEP or AFMEA, I would be most happy to answer them.

THE USAF

MANAGEMENT ENGINEERING

PROGRAM

OVERVIEW

BACKGROUND OF MANAGEMENT ENGINEERING PROGRAM

AIR FORCE MANAGEMENT ENGINEERING AGENCY

- MISSION

- SPECIAL INTEREST PROJECTS

MANAGEMENT ENGINEERING STUDIES

LONG RANGE OBJECTIVES

CONCLUSION

BACKGROUND OF MANAGEMENT ENGINEERING PROGRAM

BEGAN IN 1959

MISSION

- DEVELOP WORK CENTER LEVEL MANPOWER STANDARDS

QUEST FOR IMPROVEMENT

- 1973 - COMPLETED IN-DEPTH STUDY OF MANAGEMENT ENGINEERING PROGRAM
- RECOMMENDED FUNCTIONAL MANAGEMENT ENGINEERING TEAM CONCEPT
- 1974 - TESTED AND APPROVED CONCEPT
- 1975 - ACTIVATED AIR FORCE MANAGEMENT ENGINEERING AGENCY
- 1978 - ASSIGNED AGENCY TO AFMPC

MISSION

SUPERVISE AND MANAGE THE AIR FORCE MANAGEMENT ENGINEERING PROGRAM (MEP)

ASSIST THE AIR STAFF IN VALIDATING AIR FORCE MANPOWER REQUIREMENTS

SUPPORT THE AIR STAFF IN WARTIME MANPOWER PLANNING AND IN ASSESSING WARTIME

REQUIREMENTS

SUPPORT THE AIR FORCE PRODUCTIVITY PROGRAM

ADMINISTER THE AIR FORCE GRADES MANAGEMENT PROGRAM

CONDUCT APPLIED RESEARCH IN THE MANPOWER MANAGEMENT FIELD

SPECIAL PROJECTS OF INTEREST

TOTAL MANPOWER REQUIREMENTS AND RESOURCES (TOMARR)

AIR FORCE ENGINEER REQUIREMENT STUDY

MANPOWER ANALYSIS REQUIREMENTS FOR SYSTEM ACQUISITION

STANDARDS DEVELOPMENT CONCEPT

MEP STANDARDS STUDIES

TOTAL STANDARDS DEVELOPED:	
- NOW CURRENT	19,425
	8,090
TOTAL STUDY RESULTS:	<u>AUTHORIZATIONS</u>
- REDUCED	45,302
- INCREASED	26,283
- NET IMPACT	-19,019
STUDIES SCHEDULED:	
- AIR FORCE	124,050
- COMMAND	83,364
STUDIES PLANNED:	
- AIR FORCE	49,675
STANDARDS COVERAGE:	
- TOTAL AF AUTH	812,573
- COVERED	508,956
- %	62.6

LONG-RANGE OBJECTIVES

REDUCE STANDARDS DEVELOPMENT TIME

OPTIMIZE PRODUCTIVITY OF FUNCTIONS SERVICED

IMPROVED SKILLS/GRADES DETERMINATION

ENHANCE DATA AUTOMATION SYSTEMS

IMPROVE WARTIME REQUIREMENTS DETERMINATION

DEVELOP ZERO-BASE TOTAL REQUIREMENTS PACKAGE

MARCH 26, 1976 - COMMITTEE ON ARMED SERVICES, HOUSE OF REPRESENTATIVES REPORT NO. 94-967

"THE AIR FORCE REMAINS THE BEST MANAGED SERVICE IN TERMS OF MANPOWER . . . THE COMMITTEE HEARD A GREAT DEAL OF TESTIMONY CONCERNING THE MANAGEMENT ENGINEERING PROCESS USED BY THE AIR FORCE IN ITS EVALUATION OF MANPOWER REQUIREMENTS . . . THESE MANAGEMENT ENGINEERING CONCEPTS HAVE APPARENTLY BEEN A MAJOR CONTRIBUTING FACTOR TO THIS SUCCESS. THE OTHER SERVICES, WHICH USE THESE PROCESSES TO A LESSER DEGREE, ARE ENCOURAGED TO TAKE SIMILAR STEPS."

83

APRIL 7, 1977 - COMMITTEE ON ARMED SERVICES, HOUSE OF REPRESENTATIVES REPORT NO. 95-194

"THE MANAGEMENT ENGINEERING TEAMS ASSIGNED AT ALL AIR FORCE INSTALLATIONS PROVIDE A UNIQUE CAPABILITY NOT AVAILABLE IN THE OTHER SERVICES . . . THE AIR FORCE HAS BEEN IN THE FOREFRONT OF MANPOWER DEVELOPMENTS AND PROGRESS IN THE DEPARTMENT OF DEFENSE IN RECENT YEARS . . ."

CURRENT PRODUCTIVITY INITIATIVES

USAF MANAGEMENT ENGINEERING EFFORTS

- STANDARDS DEVELOPMENT
- MANAGEMENT ADVISORY STUDIES
- PRODUCTIVITY IMPROVEMENT STUDIES
- FAST PAYBACK CAPITAL INVESTMENT (FASCAP) PROGRAM
- JOINT PRODUCTIVITY COUNCIL
- FEDERAL PRODUCTIVITY REPORT

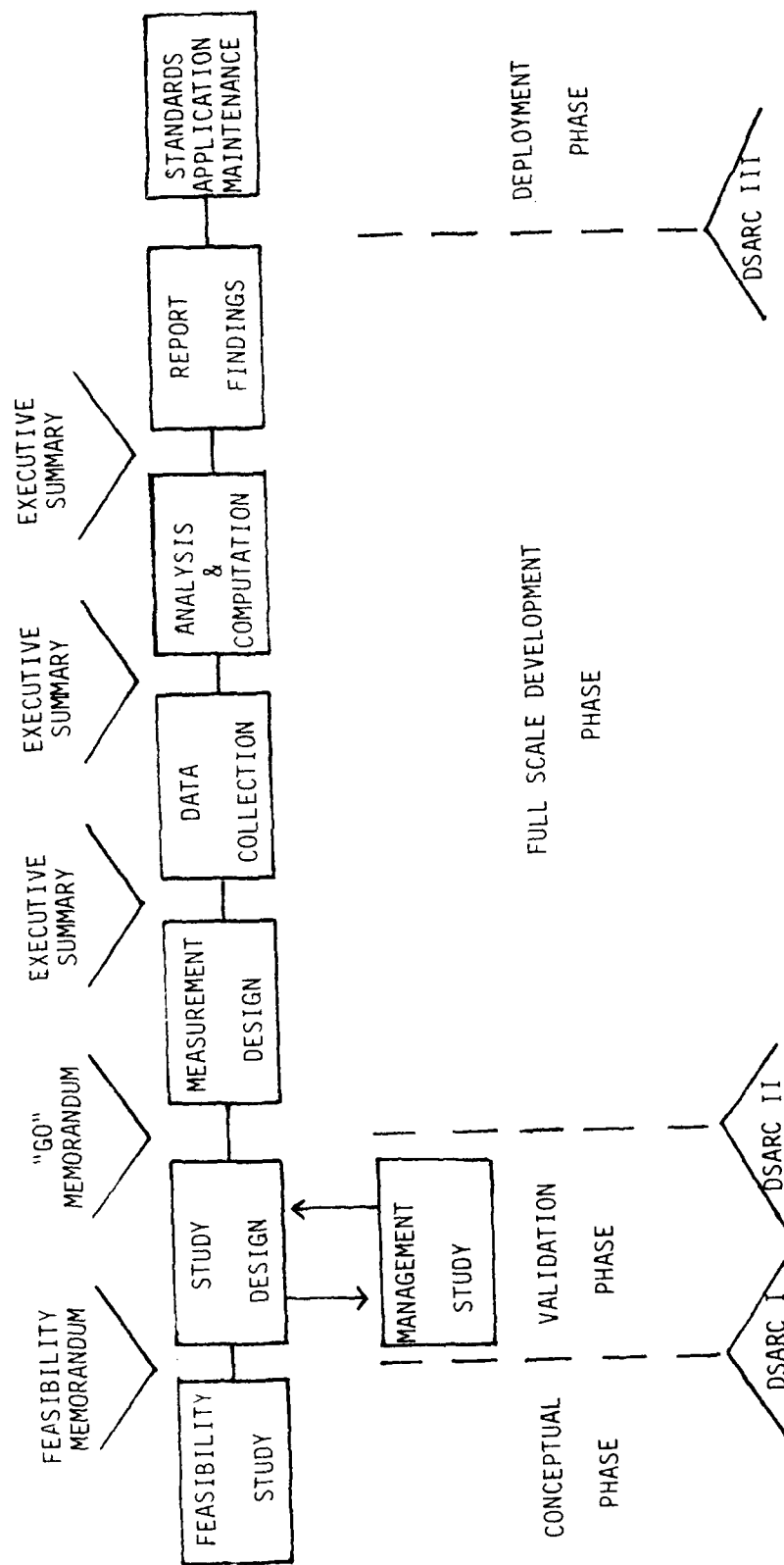
AFMEA REORGANIZATION

REVISED STANDARDS DEVELOPMENT PROCESS

TODAY'S STANDARDS DEVELOPMENT PROCESS

<u>PHASE</u>	<u>TIME (WEEKS)</u>
- PRELIMINARY	24
- MEASUREMENT	11
- COMPUTATION	14
- APPLICATION AND IMPLEMENTATION	<u>17</u>
TOTAL	66 WEEKS

PROPOSED PROCESS



DEFENSE SYSTEM ACQUISITION PROCESS

The AFLO Productivity Program

Briefer

Maj Russell Lloyd, USAF

THE AFLC PRODUCTIVITY PROGRAM

SLIDE #1

INTRODUCTION

Good afternoon, gentlemen. I want to thank the Air Staff and the Leadership and Management Development Center for the opportunity to share with you today what we in AFLC have done to conceptualize and implement an operational productivity program.

Let me first clarify where I will be coming from as I share my thoughts with you today. While I am an academician myself, and while my affection is as much for research/consulting as it is for the hands-on conduct of an operational program, I will present to you today a perspective not from the point of view of an academician, but from the point of view of one who has been involved in the nuts and bolts of organizing and conducting a MAJCOM productivity program. I have been involved from when the need for an organized program was first considered; through the necessarily protracted process of staffing and briefing the many iterations; to the final approval and implementation; and then through the prolonged process of opening the door, refining our preconceptions, establishing our procedures and, not unimportant, publicizing ourselves to an audience not altogether interested in nor convinced of the need for a sanctioned productivity program.

AFLC is the only MAJCOM which has formalized a command-wide program. To my knowledge, that claim may even apply to the entire DOD. But, I must say at the outset AFLC does not have all the answers! On the contrary, we are still struggling with some of the elusive issues. What we do have however, is experience and hopefully the concomitant wisdom that comes from having made mistakes and learned from them.

Our efforts to establish a command-wide productivity program have spanned the better part of five years, and I think it wise to briefly share that history with you to provide a base from which we can then discuss the concepts of AFLC's productivity program and the role of our corporate office in implementing/directing the command to the fruition of those concepts. In concluding, I want to make some recommendations to the symposium with regard to how we in AFLC feel an Air Force productivity program should be organized.

SLIDE #2

BRIEF HISTORY

For all of us here today, the genesis of the DOD productivity program began in 1973 with the conduct of the Joint General Accounting Office, Civil Service Commission, and Office of Management and Budget Study. Among other things, the DOD productivity program was born out of that study in 1975 with the publication of the DOD directive 5010.31 and its accompanying DOD instruction 5010.34.

SLIDE #3 (DUAL PROJECTION W/SLIDE #2)

While those directives did exist, there was an absence of Air Force directives. It is true that the Air Force drafted a proposed regulation, AFR 25-3, but as you all are aware, that regulation is still in staffing and it is now nearly five years since it was drafted. The reasons why that regulation has remained in staffing are many and varied and are of interest; but I do not think it is appropriate for me to elaborate on those reasons at this symposium. The fact remains that there was an absence of Air Force directives.

SLIDE #4 (DUAL PROJECTION W/SLIDE #2)

Despite that dearth of direction, there did exist within AFLC a proliferation of productivity programs. This slide depicts some of those programs. It is not intended to be a comprehensive listing, since many field activities replace, amend, and add to their programs on a rather random basis. We are never quite sure at headquarters when we have a complete listing of precisely what is going on within AFLC. I will not take the time to expand on any one program, but merely indicate to you the extent to which our command is involved in the business of enhancing productivity. While this list does not reflect exactly what was going on in 1975, simply because some of the programs shown here are rather new, it is accurate to say that a comparable list of programs did exist at that time.

The evolution of our program was somewhat expedited in 1976 when a field commander expressed his concern to the AFLC Commander that, while all of these enhancement programs are necessary, they also are costly! The field commander suggested that perhaps there should be some effort at MAJCOM headquarters to ensure that a balance was achieved between efforts to enhance productivity on the one hand, and efforts to hold down the cost of doing so on the other. This letter served to answer a need we at headquarters also had felt but were unable to articulate. That letter prompted the headquarters to put together a joint task group, composed of plans and programs and personnel resources, to investigate how best to achieve this balance.

Now, prior to the establishment of this task group, there had been at least two other initiatives taken to formalize a productivity program. Each time these initiatives were defeated, simply because the AFLC staff could not reach concurrence on how best to implement a command-wide productivity program. This joint task group, realizing the difficulties that had been experienced before, developed a new position which took the DOD directive and its accompanying instruction and identified those requirements which AFLC, and any other MAJCOM for that matter, would have to comply with, and used those requirements as the structure for a command-wide program. Once those requirements were identified, a concept of operations fell out of it. From that concept of operations, a formal recommendation as to what kind of an office was required, where it should be placed organizationally, and the manning resources necessary to run it was presented and briefed to the leadership of the command. Many briefings took place throughout the staff, up to the Chief of Staff, and then to the vice commander. When the vice commander was briefed, he requested that the briefing be presented to the field; that is to say, to each field commander and his executive staff so as to solicit their comments and recommendations prior to formally presenting it to the commander of AFLC for ultimate approval.

These briefings took place over the span of a number of months and then necessary revisions were made. The formal proposal to establish a corporate office of productivity at MAJCOM level was presented to the commander of AFLC in September of 1978, at which time he approved the formation of the AFLC office of productivity. It was placed within the Deputy Chief of Staff for Plans and Programs. The Commander also approved the concept of operations and requested the necessary manning be placed within that office from existing resources. No new authorizations were required.

Let me refer again to the higher headquarters directives. I indicated that in 1975 the DOD directive and the DOD instruction was published and that the draft AFR 25-3 was completed and proposed. Since 1975 no new direction has come from higher headquarters with the exception of the Air Force productivity plan which I am sure we all are familiar with. In AFLC we see that plan as a series of steps or milestones to be achieved before the regulation can be published.

SLIDE # 5

CONCEPTS

Turning now to the concept of operations of our corporate office of productivity, let me start by indicating that AFLC has experienced a great deal of difficulty with respect to defining productivity. It has been our experience that, if not careful, one can find himself in a battle with field and headquarters personnel as to just what productivity means. Often this discussion becomes prohibitive in that it can easily draw ones attention away from the benefits of a productivity program to an unnecessary and unfruitful discussion of the finer definitional distinctions. What we attempted to do was to focus on that portion of the definition that most, if not all, agree d with. Simply stated, that definition is as follows: If nothing else, productivity is the relationship between how much of a product or service is produced and the quantity of resources consumed in producing that product or service. That is to say, it is the classical ratio of output over input. Most agree that, if nothing else, this is a reflection of productivity. Of course, there is also disagreement with respect to what should be included in the denominator, that is, input. The DOD places excessive emphasis on labor only. To the DOD, input is exclusively labor; that is, the number of man-hours expended. We in AFLC feel strongly that to limit the input factor to man-hours is to be deceptive. We have gone on record officially as recommending that such inputs as energy, the amortized cost of equipment, and value of other resource that can be quantified should also be included in the denominator. There are also substantial differences of opinion as to the measurement of the numerator--output. Certainly, that is a problem we will continue to work with in the productivity business. Traditionally, this has been a source of many arguments and in my opinion it will be the single most elusive problem we will face.

As we have attempted to implement a command-wide program, it has been our experience that there is considerable misunderstanding amongst both field and headquarters managers as to what precisely is meant by the three elements of the DOD-Air Force productivity program; that is, productivity measurement, management, and evaluation. I want to take some time to share with you what we feel these three elements represent. It is particularly

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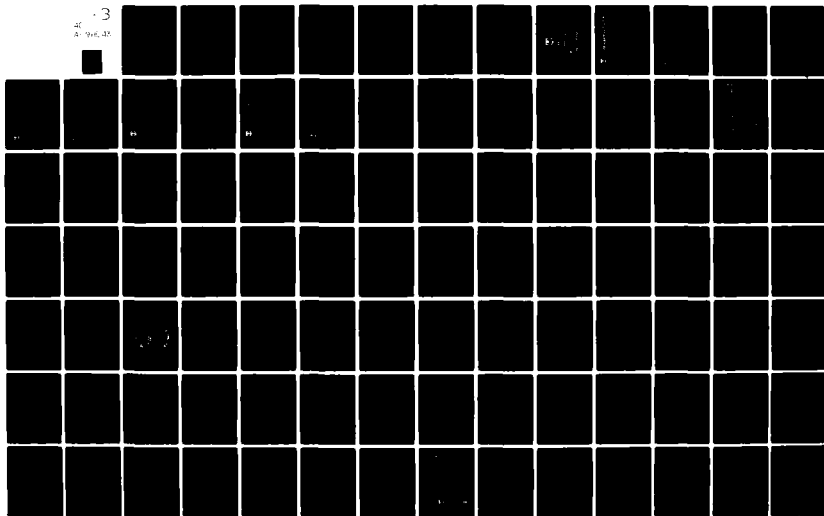
LEADERSHIP AND MANAGEMENT DEVELOPMENT CENTER MAXWELL--ETC F/G 5/1
AIR FORCE PRODUCTIVITY SYMPOSIUM HELD 12-13 FEBRUARY 1980, MAXW--ETC(U)
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important to establish our definition of these three elements before we continue, because without understanding our concept much of the remainder of the briefing might be somewhat confusing to you.

Let me begin with productivity enhancement. We see enhancement as simply those productivity initiatives that have as their purpose increasing productivity. Examples of enhancement initiatives would be any one of the PEGI programs, the Job Enrichment initiative going on around the Air Force, the Buck Stop initiative, the management advisory studies conducted by the MET teams, the Methods program, or any of the programs that we often include under the rubric of organization development (e.g., survey feedback, team building, etc.). These are but a few. Simply stated, productivity enhancement initiatives can run the gamut from the traditional industrial engineering-oriented programs, all the way over to the more contemporary organizational change initiatives. Enhancement initiatives are the actions taken by management down in the trenches where the war is raging--actions taken by them to improve productivity.

Evaluation and measurement are the two terms most often confused. We see evaluation as simply those actions taken by management to determine the effectiveness of a particular enhancement initiative. It would be better labeled "program evaluation" because it is often confused with measurement. We do not see the two terms evaluation and measurement as being synonymous. Evaluation actions taken by management could range anywhere from a subjective determination of whether or not a particular enhancement initiative achieved its objective, to a more rigorous evaluation research program using an experimental design and involving data collection and statistical analyses of the data. We feel that the technique of evaluating a particular enhancement initiative must be left up to the prerogatives of the manager conducting the enhancement initiative.

Measurement, on the other hand, refers to the determination of whether or not an organizational entity has increased its productivity over time. That determination requires the existence of a productivity measurement system, or what we might call an indice. It is derived by identifying certain factors that when counted (often weighted), and compared against the base year, a quantifiable expression of change can result. Measurement, therefore, refers to what extent an organization has improved its productivity as expressed by such an index. Over a given period of time, any number of enhancement initiatives could be operating within an organization. Each enhancement initiative, of course, has as its' purpose increasing productivity. The measurement of productivity pertains not to determining the effects of any one particular enhancement initiative (that is the intent of evaluation) but to determining the collective effects of all the enhancement initiatives, as measured by affective and/or objective measures. Stated another way, measurement pertains to determining to what extent the organization as a whole has improved its productivity by virtue of conducting any one or combination of enhancement initiatives, and as measured by a productivity index.

SLIDE #6

RESPONSIBILITIES

Let me now move to the responsibilities of the corporate office of productivity. In so doing, I must first speak of a foundational concept

that is absolutely at the root of the DOD productivity program. That foundational concept is the fact that the DOD productivity program is a functionally oriented program. By that I mean that the DOD conceives of the productivity program as operating within each functional element. The effect of that is significant; a productivity point of contact, or OPR, exists in each function across the Air Force, and that OPR insures that his function has a productivity program operating. Each function, then, has its own mini productivity program; to a greater or lesser extent, a mirror image of one another. Each functional productivity program unfolds over time, having its own distinctions, but sharing certain reporting requirements, the flow of which is vertical within that function.

SLIDE #7

REPORTING REQUIREMENTS

In AFLC, the program we have implemented has the following responsibilities. Each headquarters DCS/CSO is responsible to insure that their subordinate functions establish and maintain a productivity effort which includes, as a minimum, productivity enhancement initiatives, evaluation of those initiatives, and a measurement effort. The responsibility for the operational conduct of that productivity effort exists within the functional directorates at the field activity. Each field directorate is responsible for determining which productivity enhancement initiative will take place, how those enhancement initiatives will be evaluated, and what effort will take place in the way of establishing and/or refining a productivity measurement system.

Of critical importance to the productivity program within AFLC, is the requirement to establish goals at field level. More specifically, every manager in the field is required to think carefully about what productivity enhancement initiatives he desires to conduct for the coming fiscal year. Once those decisions are made, he is required to establish specific enhancement goals and to report them. He is also required to establish specific evaluation goals for each enhancement initiative; that is to say, goals which indicate how he plans to determine whether or not the enhancement initiative(s) he chose achieves its intended purpose. He is also required to establish measurement goals and to report those. His measurement goals will indicate what action he plans to take to update a measurement system if it exists, or what actions he intends to take towards establishing a productivity measurement system. In all three cases, the manager in the field is required to establish goals for the budget year and to report them, and also to indicate the progress he has made against those goals he established in the prior fiscal year. These reporting requirements are designed to ensure that each headquarters DCS/CSO accomplishes the responsibilities I have just described. Each DCS/CSO is responsible to collect from his field counterparts the goals for enhancement, evaluation and measurement, and to submit those to us by 30 November of each year. We then take those goals and use them as the basis for our report to Air Force which is due by 31 December of each year.

Additional reporting requirements exist within AFLC. The functions of Maintenance (MA) and Logistics Operations (LO) input data into the federal productivity report. So, in addition to the goals I have just discussed,

we must also submit MA and LO inputs to HQ AFMEA by 30 November of each year. Our office also has a commitment to report to the AFLC Commander annually on the state of AFLC productivity.

SLIDE #8

ORGANIZATION AND MANNING

Let me turn now to a brief discussion of how our office is organized. Within the office of productivity we have three functions: the organization improvement (OI) function, the productivity measurement and evaluation function (M&E) and the orthodox job enrichment (OJE) function. I want to briefly describe the primary responsibilities of the OI function and the M&E function. My comments concerning the OJE function will be brief and I will explain why at that point.

SLIDE #9 (DUAL PROJECTION W/SLIDE #8)

The OI function has three main responsibilities. The first is to guide and assist each functional element within the command in developing their productivity enhancement goals. We view the establishment of these goals at field level as critical to a meaningful productivity program. As such, the OI function was established to provide guidance and expertise to the functions in establishing their goals.

The second primary responsibility of the OI function is to conduct pilot productivity projects concerning enhancement initiatives that are new on the scene. It has been our experience that often productivity enhancement initiatives are suggested by higher headquarters, colleagues in the field in other MAJCOMS, other service departments, elsewhere in the federal government, and sometimes from private industry. Then too, enhancement initiatives are often suggested by subordinate units in the field. When these enhancement initiatives are suggested, it is our responsibility to determine their applicability for AFLC. That is best done by conducting a pilot research project. The OI function is responsible for doing just that. Those pilot projects are conducted in an evaluation research mode so that we can identify which enhancement initiatives are worthy of recommendation to the field.

A third responsibility of the OI function is one that we feel is extremely important. Perhaps the greatest singular weakness in the field of organizational change is the need for competent diagnosis. Typically, change agents enter an organization with a bias towards a particular enhancement initiative. Irrespective of what they see, they recommend the same intervention simply because it is the one they are most comfortable with or have the greatest expertise in. That intervention may not be the most appropriate, given the particular needs of that organization. What is required, rather, is an extensive diagnosis to first determine the needs of the organization at that point in time, and, secondly, the most appropriate change program to meet those needs. The organization improvement function is responsible to offer this diagnostic service. We call it a "needs analysis," and it is conducted upon request from a manager anywhere in the field or headquarters. The OI function serves as the diagnostician in that we offer the service of collecting and analyzing diagnostic data with all

assurances of anonymity. After the data is analyzed, it is fed back to the requesting manager. His strengths are identified along with his weaknesses, and recommendations are made as to which productivity enhancement initiative(s) is appropriate, and where that manager can go to get the assistance needed. If appropriate, the OI function can also serve as a follow-on change agent.

SLIDE #10 (DUAL PROJECTION W/SLIDE #8)

The M&E function similarly has three main responsibilities. The first is to assist functional managers in establishing output indicators that can be used to update existing productivity indices or establish a new productivity measurement system. Secondly, the M&E function conducts reviews of productivity systems and initiates action to improve those systems where needed. Finally, the M&E function publishes and maintains procedures for functional managers to evaluate their own productivity enhancement initiatives.

SLIDE #11 (DUAL PROJECTION W/SLIDE #8)

The OJE function was included in the office of productivity because of direction by the AFLC Commander to place it there when the office was formed. The intent is to institutionalize OJE eventually, at which time this function will be deleted. OJE will then exist throughout AFLC just as any other enhancement initiative: managers in the field will call upon OJE as an enhancement initiative at their own volition. At that time, no headquarters personnel will be required to direct the OJE program.

You can see from this organization and manning chart that we are not a large office. Within the OI function there is a military behavioral scientist and a civilian management analyst. The M&E function contains a civilian maintenance specialist, and a civilian industrial engineer. The OJE function contains a military staff logistics officer and a civilian OJE specialist. At such time that the OJE function is deleted, those two authorizations will be consumed by the OI and M&E functions.

SLIDE #12

KEY ISSUES

Let me change gears at this point and share with you some key issues that AFLC has identified. As we attempted to formalize and implement a command-wide productivity program over the last three to five years, we have seen four critical issues surfacing consistently. We feel these issues need resolution at Air Force and DOD levels before an effective Air Force productivity program can be implemented. These four issues are: (1) whether or not an office of productivity is required at field level; (2) the issue of reinvestment of savings; (3) inclusion of productivity data in the planning, programming and budgeting system (PPBS); and (4) the reporting requirements.

We have been impressed with how frequently these four issues arise whenever one considers a formal productivity program. Accordingly, in November of 1979, we convened an AFLC productivity program conference at which time we called in from the field, and from the headquarters staff, fifty

executive-level personnel and charged them to develop AFLC positions on these four issues. The conference agenda was highly structured, and was facilitated in order that the diverse opinions could be brought together to form a mutually agreed upon AFLC position for each issue. This conference was suggested by the Vice-Commander of AFLC who also served as the keynote speaker. We feel the conference was an overwhelming success. The results of the conference were then used to develop four position papers which were attached to a letter (5 Feb 80) from the Commander of AFLC to the Vice-Chief of Staff of the Air Force. The letter indicated that AFLC felt the issues were central to the success of the Air Force productivity program, and the letter requested that the Air Staff review the AFLC positions and implement them into the Air Force productivity program. We are awaiting a reply.

Briefly, the AFLC positions are as follows: We feel that in order for an Air Force productivity program to succeed there must be a focal point for productivity in the field. We also feel that any savings resulting from a manager's aggressiveness in enhancing productivity must be returned to that manager for reapplication against valid but unfunded workloads. Without this incentive, any productivity program will fail! Our executives who attended the conference were overwhelming and firm in this contention. AFLC's position also states that the reinvested savings should remain with the saver for the remainder of the current year plus an additional year. We realize that in order to implement such a program traditional personnel practices and procedures will have to be changed. We indicated that this is such an important aspect of the productivity program that any change required must be accomplished. Additionally, AFLC's position is that productivity data should be included in the PPBS, but should not be used routinely to justify changes in force levels. Additionally, we recommend that the reporting requirements be consolidated wherever possible so as to minimize the quantity of reports required. Finally, we recommend that the statistical portion of the federal productivity report be deleted as a requirement.

SLIDE #13

RECOMMENDATIONS

I want to conclude by sharing some recommendations that we feel are necessary for a successful Air Force productivity program. First, we think it is absolutely essential that the Air Force first establish what I like to call an "infrastructure," and then fine tune it. The Air Force cannot begin doing anything unless it has something to do it with. We have spent far too long and far too much of an effort thinking, and talking, and philosophizing about what we should do. The result has been that many fragmented efforts across the Air Force have naturally evolved in this vacuum. While it is necessary to conceptualize and to reason through these issues, we feel that the Air Force has long since reached the point where further discussion is counter-productive. I draw your attention to the programs established within the Departments of the Army and Navy. While I would not necessarily agree with the specifics of what they are doing, I want to remind you that they are at least doing something. They have established a formal, officially sanctioned program with manning authorizations assigned, responsibilities defined, and dollars allocated. In short, they have programs in being, and can now readily come in and refine them. The Air Force has nothing to show, or at least very little to show, for all of its talk.

Now, with respect to how one develops an "infrastructure," let me make some comments concerning that. First, a new productivity functional line must be established. The requisite action to accomplish that is to remove the productivity responsibility from the manpower channels. We feel that the perception held by most throughout the Air Force concerning manpower and its emphasis on reducing authorizations is, to be sure, inaccurate; but, nevertheless, it is a powerful deterrent to willing participation. To place the responsibility for a productivity program in manpower is to invite a great deal of suspicion as to the intention of such a program. The perceptions just spoken of are so powerful as to sabotage the beneficial effects of a productivity program.

We recommend that at Air Staff level the productivity office should be established as a new organization reporting to the Assistant Vice Chief of Staff, and that it carry the title of Assistant to the Commander for Productivity. At MAJCOM level we recommend that a similar office be established reporting to the Chief of Staff and entitled Assistant to the Commander for Productivity. Within the field, we recommend that the office of productivity report directly to the Vice-Wing Commander.

Certainly if these offices are established they must be manned. We do not recommend any new authorizations be requested. Rather, we recommend using existing productivity-related authorizations. As we look about the Air Force we see a great deal of duplication existing in productivity related programs. For example, we understand the human relations program has recently taken on an interest in organization change. They have sent personnel to receive training in organization development. That is an unnecessary and wasteful duplication. Similarly, the job enrichment function within the Air Force has 33 authorizations (not counting those in AFLC) in it that could be used for an Air Force productivity program. The Management Engineering Program (MEP) has long stated that 10% of its authorizations are intended to conduct management advisory studies. Those studies are not conducted because of the continuing emphasis of the establishment of manning standards. There are presently 2400 MEP authorizations across the Air Force. Ten percent of those (i.e., 240) could be used to man an Air Force-wide productivity program. The consultant teams at LMDC could also be used as a source of authorizations. A centralized consultant staff (i.e., LMDC) to service the entire Air Force is a costly and ineffective method of meeting the needs of managers in the field. LMDC has not, cannot now, and never will be able to meet the demands for its services, particularly as the demand increases as a result of the productivity program getting the high-level support we all feel it needs if it is to approach its potential. In order to meet those demands, LMDC would necessarily have to grow to enormous proportions. Private industry has experientially learned, and empirical research has supported, that a centralized corporate change agency is threatening and does not typically have the understanding of local exigencies. In short, they are not members of "the team." The lesser of evils appears to be the decentralized concept in which a consultant(s) is located at each field unit. LMDC could/should become a research and consultation training center wherein rigorous research on the many productivity issues could be conducted/managed, and update training in consultation skills could be offered to field/majcom consultants around the Air Force. These are but a few examples of where existing productivity-related authorizations can be found. There are more around! We feel confident that a thorough study of

productivity-related authorizations would result in many more existing personnel equivalents that could be and would be best consolidated for the development of an effective Air Force productivity program.

Secondly, we feel that autonomy in program management is essential at the MAJCOM level and below. The MAJCOM commander and the field commanders should have great latitude in the conduct of their respective productivity programs. That will help greatly in obtaining their involvement.

Thirdly, support from top management is absolutely essential for a successful productivity program. Despite all the talk, there is still no visible support from the top. Unless that support is forthcoming; unless MAJCOM commanders understand that this program is important, any effort within a MAJCOM will necessarily struggle for attention.

Finally, there is so much more I could comment on with respect to the organization of an Air Force productivity program, its' concept of operations, etc., that for me to do that now would be inappropriate. But, I do want to comment on one more issue; that is productivity measurement and the historical emphasis it has received. It is our opinion that the emphasis should not be placed on measurement (particularly at the macro level) as much as on enhancement. That is where the money is to be made! Certainly, we need to improve our productivity measurement systems so that a manager can better appreciate the progress he has achieved. But he first must be aggressive in improving his productivity before he can measure it.

CONCLUSION

I thank you for the privilege that is mine to have had this opportunity to share with you what we in AFLC feel are appropriate steps that should be taken towards the establishment of an effective Air Force productivity program. To be sure, what we first establish will not be the best. It will necessarily have its foibles. But until we make a commitment to do something we cannot improve upon it. I encourage us all to use our wisdom and the results of our experience to boldly step forward with the best program that we can now conceive of, recognizing full well that it will not be the optimum approach. Achieving what is optimum comes only from precious experience. Our hope lies in committing to get experience rather than further discussion.



AFLC COMMAND PRODUCTIVITY PROGRAM

AFLC - Lifeline of the Aerospace Team



PROGRAM EVOLUTION

- JOINT GAO, CSC AND OMB STUDY (1973)**
- DOD PRODUCTIVITY PROGRAM (1975)**
- ABSENCE OF AF DIRECTIVES**
- PROLIFERATION OF AFLC PROGRAMS**
- JOINT DP/XR TASK GROUP**
- CC APPROVES FORMATION OF XRV (SEP78)**
- CONCEPT OF OPERATIONS**



HIGHER HQ DIRECTIVES

DODD 5010.31

DODI 5010.34

AFR 25-3 (PROPOSED)

AIR FORCE PRODUCTIVITY PLAN

COMMAND-WIDE PROGRAMS

- o LOGISTICS IMPROVEMENT OF FACILITIES & TECHNOLOGY (LIFT)
- o MILITARY CONSTRUCTION PROGRAM (MCP)
- o VALUE ENGINEERING (VE)
- o MAINTENANCE CERTIFICATION PROGRAM
- o MANAGEMENT ADVISORY SERVICES (MET)
- o TECHNOLOGY INTERFACE PROGRAMS (MAN TECH)
- o MAINTENANCE INDUSTRIAL PROCESS REVIEW
- o DEPOT PLANT EQUIPMENT PROGRAM (DPEP)
- o BUICK STOP
- o ORTHODOX JOB ENRICHMENT (OJE)
- o PRODUCTIVITY ENHANCING CAPITAL INVESTMENTS (PECI)
 - o OSD PRODUCTIVITY INVESTMENT FUND (OSD PIF)
 - o PRODUCTIVITY ENHANCING INVESTMENT FUND (PEIF OR FASCAP)
 - o INDUSTRIAL FUND PECI
- o USAF SUGGESTION PROGRAM
- o AERONAUTICAL DEPOT MAINTENANCE TECHNOLOGY (ADMIT)
- o TRAINING
- o PRAM
- o METHODS IMPROVEMENT PROGRAM
- o FLEXITIME

CENTER-SPECIFIC PROGRAMS

- o JL-MPC
- o SCAC
- o PROCESS REVIEW
- o INTEGERS OF LOGISTICS
- o ROLE CLARIFICATION
- o ORGANIZATION EFFECTIVENESS
- o CONSULTING
- o QC CIRCLES
- o PRODUCTIVITY BOARDS



CONCEPTS

DEFINITION OF TERMS:

PRODUCTIVITY - RELATIONSHIP BETWEEN VOLUME OF
GOODS AND SERVICES PRODUCED AND THE PHYSICAL
RESOURCES CONSUMED IN THEIR PRODUCTION OVER A SPECIFIED
PERIOD OF TIME; I.E., A RATIO OF $\frac{\text{OUTPUT}}{\text{INPUT}}$.

ENHANCEMENT -

MEASUREMENT -

EVALUATION -



RESPONSIBILITIES

FOUNDATIONAL CONCEPT: THE DOD PRODUCTIVITY PROGRAM IS
TO BE A FUNCTIONALLY ORIENTED PROGRAM

HQ DCS/CSOs: ENSURE THAT THEIR RESPECTIVE FUNCTIONS
ESTABLISH AND MAINTAIN A PRODUCTIVITY EFFORT TO INCLUDE:
ENHANCEMENT, MEASUREMENT AND EVALUATION

FIELD ACTIVITIES:

DIRECTORATES - RESPONSIBILITY FOR OPERATIONAL CONDUCT OF
PRODUCTIVITY ENHANCEMENT, MEASUREMENT AND EVALUATION
PLANS & PROGRAMS - RESPONSIBILITY FOR OVERALL PRODUCTIVITY
PROGRAM (FOCAL POINT)



REPORTING REQUIREMENTS

HQ DCS/CSO'S:

- ENHANCEMENT GOALS* BY 30 NOV TO XRV
- MEASUREMENT GOALS* BY 30 NOV TO XRV
- EVALUATION GOALS* BY 30 NOV TO XRV
- MA & LO ONLY - PRODUCTIVITY MEASUREMENT DATA BY 30 NOV TO XRV
- XR - PRODUCTIVITY ENHANCEMENT & EVALUATION EFFORTS TO AF BY 31 DEC
- XR - REPORT TO AFLC COMMANDER AS REQUIRED ON AFLC PRODUCTIVITY PROGRAM

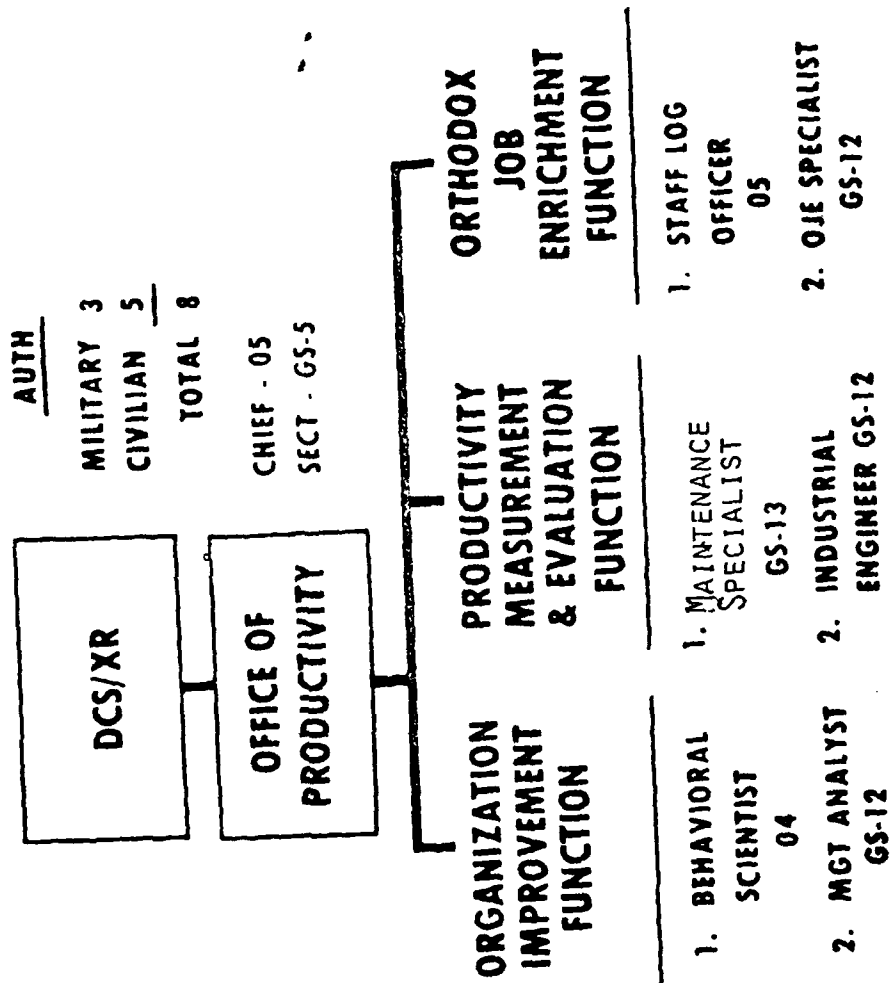
FIELD ACTIVITIES:

- ALL DIRECTORATES AND STAFF AGENCIES
- ENHANCEMENT GOALS*
- MEASUREMENT GOALS* TO HQ COUNTERPART AS REQUIRED
- EVALUATION GOALS*

* GOALS ARE ESTABLISHED AT THE FIELD LEVEL BEST ABLE TO ACHIEVE THE GOAL AND TO DETERMINE GOAL ATTAINMENT.



ORGANIZATION & MANNING





AFSC OFFICE OF PRODUCTIVITY

ORGANIZATION IMPROVEMENT FUNCTION:

- DEVELOP AN AGGRESSIVE, COHESIVE AFSC PRODUCTIVITY ENHANCEMENT PROGRAM.
- DEVELOP AFSC PRODUCTIVITY ENHANCEMENT OBJECTIVES, POLICIES, PROCEDURES, GUIDELINES, AND REPORTING REQUIREMENTS.
- DEVELOP ENHANCEMENT GOALS BASED UPON OBJECTIVES.
- MONITOR AND COORDINATE PRODUCTIVITY ENHANCEMENT EFFORTS WITHIN AFSC ASSURING CONSISTENCY WITH AF/DOD GUIDELINES AND DIRECTIVES.
- CONDUCT PILOT PRODUCTIVITY PROJECTS AND EVALUATION RESEARCH TO IDENTIFY EFFECTIVE ENHANCEMENT EFFORTS.
- DEVELOP/CONDUCT NEEDS ANALYSIS TECHNIQUES TO ASSIST HEADQUARTERS AND FIELD FUNCTIONAL MANAGERS (UPON REQUEST) TO IDENTIFY POTENTIAL ENHANCEMENT AREAS AND OBTAIN APPROPRIATE CONSULTANT SERVICES.
- REPORT TO AF/DOD ON AFSC ENHANCEMENT EFFORTS.
- MAINTAIN KNOWLEDGE OF CURRENT ENHANCEMENT EFFORTS.
- REPRESENT AFSC ON PRODUCTIVITY ENHANCEMENT MATTERS WITH AF/DOD, ACADEMIC, AND PUBLIC/PRIVATE SECTORS.
- PROVIDE TECHNICAL ASSISTANCE TO FUNCTIONAL MANAGERS IN CONDUCT OF ENHANCEMENT PROGRAMS OR PROJECTS.
- PROMOTE THE EXCHANGE OF ENHANCEMENT INFORMATION WITHIN COMMAND AND WITH AF/DOD ACADEMIC, AND PUBLIC/PRIVATE SECTORS.



AFLC OFFICE OF PRODUCTIVITY

MEASUREMENT AND EVALUATION FUNCTION:

- OVERSEES GATHERING AND REPORTING OF PRODUCTIVITY AND EFFECTIVENESS DATA.
- APPROVES OR PUBLISHES REQUIRED MEASUREMENT POLICIES, PROCEDURES, AND GUIDANCE.
- PUBLISHES AND MAINTAINS PROCEDURES FOR COMPUTATION AND ANALYSIS OF HISTORICAL AND FORECAST PRODUCTIVITY AND EFFECTIVENESS TRENDS.
- ASSISTS FUNCTIONAL MANAGERS TO ESTABLISH OUTPUT AND EFFECTIVENESS INDICATORS.
- CONDUCTS REVIEWS OF PRODUCTIVITY AND EFFECTIVENESS MEASURES AND INITIATES ACTION TO IMPROVE AS NEEDED.
- ASSESS EFFECTIVENESS OF THE CORPORATE, FUNCTIONAL, AND ORGANIZATIONAL PRODUCTIVITY PROGRAMS IN RELATION TO GOALS/OBJECTIVES, RESOURCES EXPENDED, AND WORK FORCE/CUSTOMER ATTITUDES.
- PUBLISHES AND MAINTAINS PROCEDURES FOR FUNCTIONAL MANAGERS' SELF-EVALUATION OF PRODUCTIVITY PROGRAMS.
- PROVIDE CRITERIA TO TRACK PRODUCTIVITY EFFECTS TO CAUSES.



AFLC OFFICE OF PRODUCTIVITY

ORTHODOX JOB ENRICHMENT FUNCTION:

- PROMOTE OJE THROUGHOUT AFLC.
- FOCAL POINT FOR THE DEVELOPMENT AND DISSEMINATION OF IMPROVED OJE PROCEDURES.
- PROVIDE GUIDANCE ON PROJECT MEASUREMENT.
- FOCAL POINT FOR OJE REPORTING.
- PROVIDE POLICY GUIDANCE ON THE SELECTION AND ASSIGNMENT OF KEYMEN.
- UPDATE CURRICULUM ON KEYMAN TRAINING COURSE.

KEY ISSUES

- . NEED FOR OFFICE OF PRODUCTIVITY AT FIELD LEVEL
- . REINVESTMENT OF PRODUCTIVITY SAVINGS
- . INCLUSION OF PRODUCTIVITY DATA IN PPBS
- . REPORTING REQUIREMENTS

RECOMMENDATIONS

- . DEVELOP INFRASTRUCTURE FIRST
 - .. THEN "FINE TUNE"
 - .. HOW TO
 - .. USE RELATED PES (NO NEW AUTH)
 - .. AUTONOMY OF MAJCOM/FIELD COMMANDERS
- . SUPPORT FROM TOP
- . DYSFUNCTIONAL EMPHASIS ON MEASUREMENT

Job Enrichment

Briefer

Lt Col Robert M. DePhilippis, USAF

JOB ENRICHMENT

SLIDE #1 -- OVERVIEW

- Background
 - 6 participating commands: SAC, PACAF, MAC, AFCC, AFSC, TAC
 - Operational 1 Jan 1979
 - 21 AF projects initiated
 - 12 projects evaluated as of 15 March 1980
 - Evaluation report due to HQ USAF/MPX 15 March 1980
- Model
 - Hackman Oldham Theoretical model operationalized
- Process
 - Five-step consultant process
- Payoffs
 - Job related satisfaction
 - Retention
 - Performance
 - Productivity
- Impact
 - Unit
 - MAJCOM
 - AF-wide

SLIDE #2 -- JOB ENRICHMENT

- Definition
 - Job more interesting and meaningful
 - Job challenge and responsibility
- Keying on the job itself goals to improve job through idea generation with all unit personnel

SLIDE #3 -- BACKGROUND

- Noted authorities in the Behavioral Science field have recognized the need for motivating human resources to enhance the organizational mission

SLIDE #4 -- JE MODEL

- Hackman Oldham
 - Key is on increasing the meaningfulness of work, responsibility for work and knowledge of results

SLIDE #5 -- PAYOFFS

- Job satisfaction
- Performance
- Productivity
- Impact
 - Unit
 - MAJCOM
 - AF-wide

OVERVIEW

- BACKGROUND
- MODEL
- PROCESS
- PAYOFFS
- IMPACT

JOB ENRICHMENT

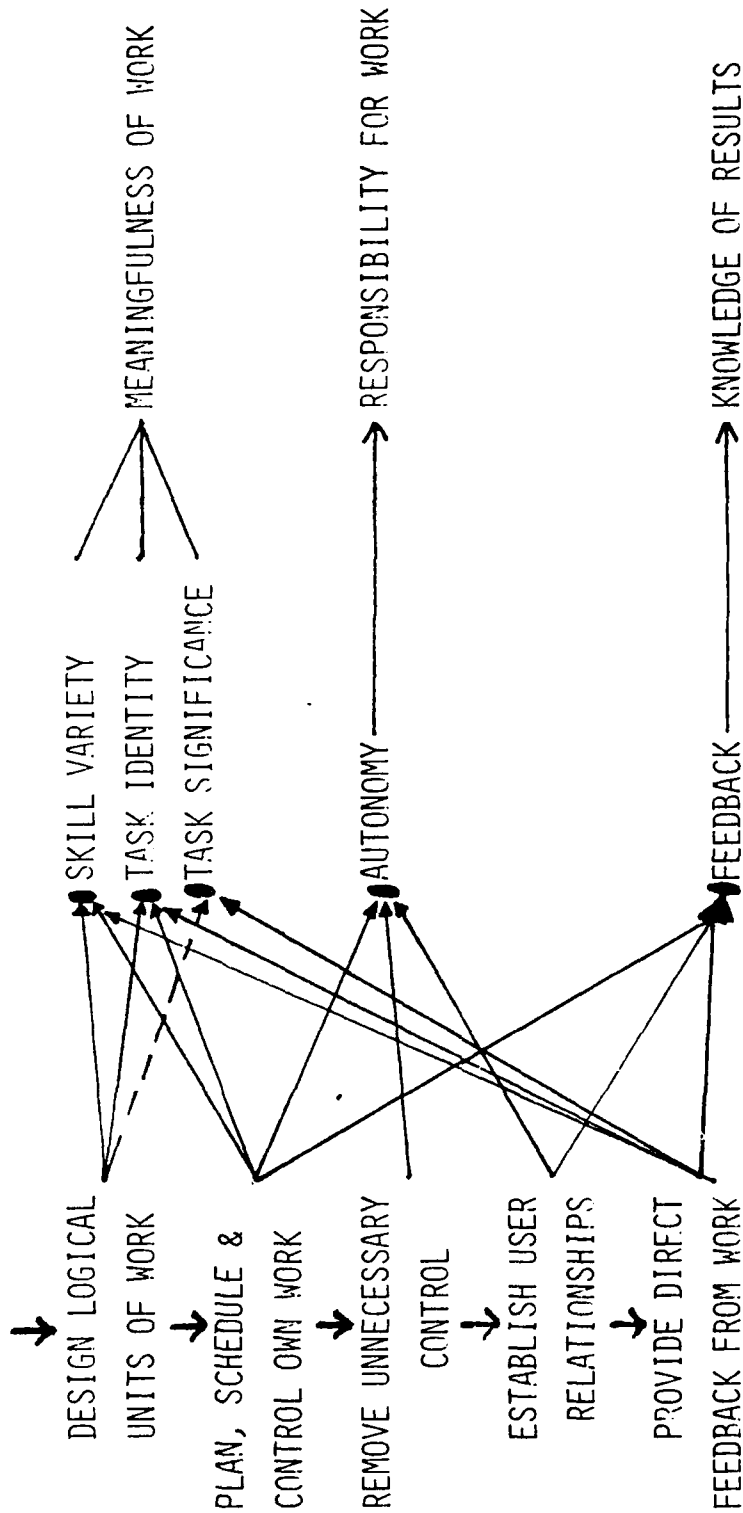
**A MANAGEMENT PROCESS WHICH
FOCUSES ON THE JOB ITSELF
WITH THE GOALS OF:**

- **MAKING JOB MORE INTERESTING AND
MEANINGFUL.**
- **INCREASING JOB CHALLENGE AND
RESPONSIBILITY.**

BACKGROUND

o MAYO
o HERZBERG
o WHYTE
o ARGYRIS
o MCGREGOR
o MCCLELLAND
o GELLERMAN
o HACKMAN

JE MODEL



PAYOFFS

JOB SATISFACTION

RETENTION, REENLISTMENT

TURNOVER

QUALITY OF WORKING LIFE

COMMITMENT

PERFORMANCE

QUALITY OF WORK

READINESS

LONG RANGE MANAGEMENT
IMPROVEMENTS

Work Smarter, Not Harder: The Air Force Productivity Program

Briefer

Col Jack Bujalski, USAF

WORK SMARTER, NOT HARDER:
THE AIR FORCE PRODUCTIVITY PROGRAM

SLIDE 1

Good morning. It is a pleasure to be with you today and talk about the Air Force Productivity Program.

SLIDE 2

This is the productivity umbrella. We use it as a symbol of our productivity program, deliberately, to show that we are primarily not a control agency, but more of an umbrella or a clearing house agency that draws together, under this one umbrella, all the programs in the Air Force that have been going on for a good number of years, that are indeed productive in nature or that have productivity overtones.

We have three facets to productivity in which we are interested in the Air Force office of productivity; measurement, evaluation and enhancement. We are concentrating primarily in the area of enhancement or, if you will, the carrot aspect of productivity--how we can do things better, not necessarily with less resources, but with the resources we have. Of course, you see under the umbrella as well the measurement aspect and we stress under measurement both efficiency and effectiveness. We should not be concerned strictly with an efficiency measure, but also with doing the things that need to be done. If they don't need to be done, then we shouldn't worry about doing them better. Measurement is an area in which we are a bit weak. There are many areas in which we simply don't know how to measure productivity. However, every functional area has management information systems, and we plan to use those systems in developing the means to measure productivity. Evaluation is what the supervisor does, of course, with the program that he has under his purview. Under evaluation, we normally rely on measurement to provide the data. We recognize in many cases there will be no productivity data. We recommend to the supervisor that he use subjective judgement to evaluate his program.

The purpose of our symposium today is to help my office at the Air Staff in developing a better productivity program. We are really not interested in philosophy or grand concepts of how productivity should be. We are interested in day to day nuts and bolts. I want to pick your brains and to develop some actions we can take in the near term that will help this Air Force Productivity Program get off to a good start. Also, I am interested in knowing how we can help you to do your job better. Maybe there is an interface with the Air Force Productivity Program and we can be of assistance to you. That is another aspect of this symposium I am interested in exploring. Let's now take a look at the Air Force Productivity Program.

SLIDE 3

We are going to look at these three areas, each in turn.

SLIDE 4

In October 1978, the President established the National Productivity Council with the membership as shown here, chaired by the Director of the Office of Management and Budget. This council was established to serve as the focal point in the Executive Branch for productivity, not only in the public sector, but in the private sector as well, to develop throughout our nation greater interest in productivity and means of achieving greater productivity. Congress is also interested in productivity, as can be seen by the list of committees and subcommittees that have held hearings on productivity.

SLIDE 5

I will give you a few minutes to read this Senate Armed Services Committee quote which deals with productivity. You will notice in this quote that the Senate Armed Services Committee required a productivity section in the FY 80 Defense Manpower Requirements Report.

SLIDE 6

The productivity section of the Defense Manpower Requirement Report included explanation of DOD Productivity Program and there is an outline of that program on this slide. The Air Force section of the Defense Manpower Requirement Report primarily told of several good ongoing initiative that we have presently in the Air Force, such as the Depot Plant Modernization Program in AFLC, the Managing Engineering Program, which has detachments throughout the Air Force at various bases, the Air Force FASCAP Program, which I will talk about a little later and, of course, the Air Force Suggestion Program which I think is familiar to everybody. The Air Force Section was fuzzy on outyear goals. We didn't have them then in the area of productivity.

SLIDE 7

DOD has recently updated their Directive 5010.31 and are in the process of drafting four instructions to supplement this directive on productivity. The four DODIs are titled as shown here. The DOD Program concentrates primarily on Labor Productivity, and we in the Air Force want to enlarge on that--to go a little bit further and include other aspects of productivity, such as capital inputs and, as well, resource inputs. The Assistant Secretary of Defense Comptroller has issued budget guidance, including the requirement for goals by Major Command and by function. The Air Force has not been particularly good at responding to this guidance, primarily again, because we had no mechanism for developing meaningful goals. The Air Force Productivity Plan, which I will address a little bit later, will provide the inputs needed for complying with the DOD guidance in the future.

SLIDE 8

However, the Air Force did include a productivity section in the FY 81-85 POM (Program Objective Memorandum). We promised goals through the

Air Force Productivity Program and we said that these goals would be established from the base level up. We did include examples of productivity improvements developed by current programs. In addition, we stressed the fact that manpower savings and dollar savings should be reinvested at the level that made the savings in the first place. I would like to turn now to capital investment.

SLIDE 9

Within DOD there are three categories of Capital Investment Programs, as shown on this slide. Within these three categories there are three Capital Investment Programs that are currently active. The one million dollar OSD Productivity Investment Fund is a major PECI (Productivity Enhancing Capital Investment). There are no nonmajor PECIs and there are two fast payback PECIs, as shown. I will address each of these three programs in greater detail.

SLIDE 10

FASCAP (Fast Payback Capital Investment) is an Air Force program that was initiated in 1977 with an allocation of six and one half million dollars. This fund provided a pot of money which could be tapped by whoever could come up with ideas to invest in equipment that would pay for itself within two years. The equipment had to be off-the-shelf. It could not be available through supply channels. The funds would be available within sixty days after the project was identified. You can see it is a fast provider of funds and does permit the manager to get the funds necessary to make a quick investment which will then give him the equipment to use now, not three years from now when the budget process gets done working on his suggestion. A couple of requirements of FASCAP were that savings had to be verified through tracking and auditing. There were also some restrictions; no lease-to-purchase. You could not purchase an item you already had on lease. Originally, there was a forty thousand dollar ceiling for projects, which we did rebut and get raised to one hundred thousand dollars. This helped the program. The lease-to-purchase restriction still hurts, but we are in the process of working on that. The program is tracked by AFMEA (Air Force Management and Engineering Agency) and the OPR provides updates every 180 days until the amortization period is over. Payback has to be either from O&M dollars, manpower or a combination of both.

SLIDE 11

I would like to show you some examples of typical projects that have been accomplished under FASCAP.

SLIDE 12

This provides a summary of how we have done in FASCAP and you will notice that we don't have a FY 78 column. That is because Congress had second thoughts on the program during the FY 77 program, and consequently, did not fund it in 78. They felt that they were giving the Air Force a blank check. In 77 they authorized 6.5 million dollars and we spent it

all. At that point, during that year, there were no restrictions on the program and there were some projects that cost more than a million dollars. We ended the year with a three million dollar backlog. The lack of funding in FY 78 hurt the program seriously. People had projects returned due to lack of funds and they lost interest in the program. Congress did restart the program in FY 79 with a little over three and one half million dollars and we have been having some troubles in getting this program flying again. People are a little bit turned off by the previous hiatus in funding. You notice that the two year savings and the life cycle savings are significant. Both years we have had two-to-one in two year savings--two-to-one payback of cost, which shows, in effect, that most of these projects are amortizing in one year. You also notice that we only spent about half of our money that was budgeted in FY 79, and we are concerned about this. We feel that if the program doesn't do a little bit better, Congress is going to again cancel us for funds. We are even having problems within the Air Force in justifying our funds for FY 80, but we did get 3.8 million dollars. We have to get people in the field to take a look at their operation, come up with ideas that will enhance productivity that will fit the FASCAP program criteria, and submit them.

SLIDE 13

The Industrial Fund Fast Payback Program applies only to Major Commands that have industrial funds. To the Air Force that means AFLC, ATC and MAC. AFLC has been the primary player in this program in the past. We hope to stimulate some interest in MAC and ATC in using their industrial funds for productivity investments. In the Industrial Fund Fast Payback Program there are no additional funds authorized by Congress. Instead, the Industrial Fund agency is authorized to use some of their funds for productivity investments. Again, the rules require off-the-shelf equipment. The amortization period, however, is three years with up to three hundred thousand dollars per project. Again this program has not been doing real well. They have been authorized to use up to two million dollars per year and they haven't come close to that as you can see here. However, there were again restrictions up until recently. Prior to March of 79, the MAJCOM could only approve up to twenty five thousand dollars per project, which bordered on the area of making the paper work more than the program was worth to the line manager. By raising the MAJCOM level up to a hundred thousand dollars and the total level up to three hundred thousand dollars the program seems to be doing better. As you can see also, the payoff is indeed significant, which the good payback figures show at the bottom of this slide.

SLIDE 14

The third capital investment program is the OSD Productivity Investment Fund. In this case, the DOD tried to shorten the time that agencies had to wait for funding under the normal budget system. Set-aside under FY 81 budget authority was 105 million dollars. They then called for projects from the services to compete for this 105 million dollars, not in money you understand, but in budget authority or the authority to put it into the budget as a budget request to go to Congress. What this avoided is having

to go through the first year of the three year cycle, having to go through the POM process in other words. Since these projects were called for on the first of October of 79 for entry into the FY 81 budget, this means they were placed in the budget in December just as the budget was being forwarded to OMB and the President. Projects did not, therefore, have to go through the normal POM process which occurred for FY 81 during the Spring of 1979.

Again, there were criteria for the projects, some of which are shown here. A minimum cost of one million dollars per project and projects must amortize within four years. Probably the most stringent requirement was that fifty percent of the savings had to be in manpower. This we have rebutted. We hope we are getting it changed. If you stop and think about it, you realize that if you had a one million dollar project that saved eight million dollars, but only one million dollars of the savings was manpower, it would not meet this fifty percent criteria. We have argued that they should at least change it to make it fifty percent of the investment cost that has to be amortized by manpower savings, not fifty percent of the total savings. We think we have succeeded in that, although we would like to see a complete disassociation with manpower. We would like to see energy cost savings, for example, given greater chance under this program.

There are other areas also where we could make significant savings that do not have to do with manpower, but under the present rules of this program manpower does have to supply fifty percent of the savings. On the positive side, OSD did emphasize the fact that savings should be reinvested at the lowest possible level--by the saver, in other words--not usurper upwards to the higher levels of Air Force or OSD. The people that show the initiative to come up with the projects should get to keep what they save to use on valid requirements within their own outfit. Certainly not to keep forever, but to keep until the normal budget process catches up with them. If they have been foolish enough to use these savings in low priority areas, they are probably going to lose them. But if they have had high priority areas that were previously unfunded, and they use the savings there, then there is certainly a very strong probability that they will get to keep them until those priority projects or priority requirements no longer exist. Projects under this program were ranked by OSD based on internal rate of return, by return on investment over the life cycle of the project, and by investment dollar per manpower authorizations saved. Using a combination of these three factors, they ranked all the projects of the services and defense agencies and then picked those for which funds would be requested. They actually only used about 65 million dollars of the 105 million set aside. The rest of the projects fell below what OSD felt was the minimum credibility level to convince Congress they would indeed pay back costs within four years. For FY 81, under this program, the Air Force had three projects approved with a cost slightly over 6 million dollars. We will show you those on this next slide.

SLIDE 15

This shows four of the projects that were submitted. Three of these were selected. The B-52 companion trainer aircraft was not and for several

reasons, one of which is immediately obvious. The cost was greater than the total set aside. The other three projects were the only three Air Force projects funded. The summary at the bottom does show the total synopsis of the projects submitted by the Air Force under this program. We submitted fifteen and with three funded, the other twelve are what make up the difference in the summary.

SLIDE 16

This slide depicts the three capital investment programs which are current in the Air Force. As you can see, we have FASCAP, industrial fund and the PIF--separate programs, but similar and complementary. In each case, manpower resources saved are to be reinvested within relatively stable, overall manpower levels to help pay manpower cost of essential improvements in the Air Force readiness posture. Hopefully, we can fill the void shown here for most of our Air Force people between FASCAP and the PIF, between one hundred thousand dollars and a million dollars. We are working such a proposal now and have hopes that it will be ready for the FY 82 budget year.

SLIDE 17

Turning now to Air Force actions in productivity, we have been making serious efforts to get senior leadership support and involvement with the productivity program. We have given this briefing to key members of the Secretary of the Air Force Staff and the Air Staff, as well as various field staffs. We are working through command and information channels to carry the story of the Air Force Productivity Program to the field. The Air Staff Productivity Committee was established a year and a half ago to provide staff wide inputs to the Productivity Program. It was recently expanded to include representation from every Directorate and Special Staff Agency on the Air Staff. A world wide conference was held in October of 78 which provided much of the conceptual basis for the Air Force Productivity Program. I will discuss this conference in detail on the next slide. We have developed an Air Force Productivity Plan which was published last November and I will talk about that in a few minutes.

SLIDE 18

A World Wide Productivity Conference in 1978 and representation from GAO, OSD, the services and the private sector, as well as throughout the Air Force. Speakers set the stage with initial speeches by General Davis, the Air Force Deputy Chief of Staff for Manpower and Personnel, and Secretary Hewitt, Assistant Secretary of the Air Force for Financial Management, who expressed the fact that productivity is a national concern and the Air Force is serious about productivity improvement. Recommendations from the conference are shown here. A couple of key ones being that we need goals and they must be established from the bottom up. Achievement of goals must result in award or reward, not in reduction. One of the key results of the conference was the requirement for an Air Force Productivity Plan.

SLIDE 19

The Air Force Productivity Plan, as I mentioned, was published in November of 79. It called for planning at all organizational goals. MAJCOM plans were required to be written and submitted to the Air Staff for review by the first of January. Goals were required, compatible with the Planning Programming and Budgeting System, to be established from base level up by functional OPRs. Another requirement of the Air Force Productivity Plan is for reporting of productivity achievements on an annual basis. These inputs are to be used in defending future budgets during the POM and the Budget cycle and during the congressional hearings. That is probably the most important area--defending to Congress our budget and using this productivity data to demonstrate to congress that we are making serious efforts to use the money they provide as efficiently and effectively as possible. In October of 79 we held a productivity workshop with MAJCOM and SOA Representation to work on the MAJCOM and SOA plans that were then in the draft stage.

SLIDE 20

This slide illustrates our concept of how the Productivity Program should operate. Ideas should be generated and validated at the user level and then forwarded up through functional channels to the approval level. In some cases, such a FASCAP, this approval level may be at MAJCOM level, funds then coming down through comptroller channels. If the approval level is higher, the project comes up to the Air Staff and, if necessary, up to OSD and even to Congress depending upon the magnitude of the project. FASCAP, the Industrial fund fast payback program, and the PIF are structured programs with designated funds. However, nothing precludes the authorized use of other funds by the Commander concerned within prescribed limits to fund productivity improvements. This, of course, would be the decision of the commander and we have examples of this in the past, such as the Depot Plant Modernization Program and Job Enrichment, where we pay for teams to travel to bases and advise supervisors and managers. One key thing we must remember is reporting. We must provide Congress with data on how we use the money they give us and so reporting is a necessity. We strongly urge use of the present Management Information Systems. We definitely do not want to create another reporting system to provide productivity data.

SLIDE 21

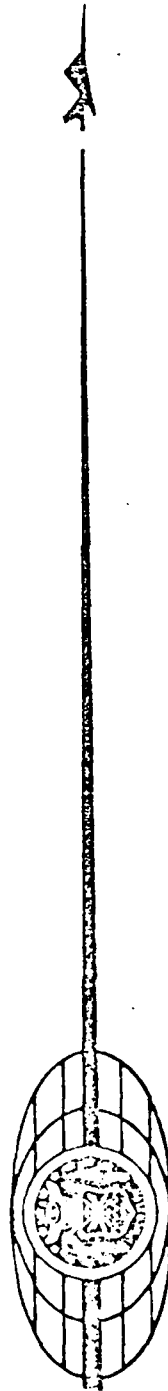
These areas are what we are currently working on. One of the key areas is to spread the word, to get everybody involved in productivity. MAJCOMs, USAF, and the Air Staff are refining their productivity plans. As I mentioned earlier, we are developing a program to complement FASCAP. We are working on it to develop and publish a productivity regulation which will provide the final formalization that the program needs. An finally, underlining all of our efforts is a requirement to satisfy congressional positions.

SLIDE 22

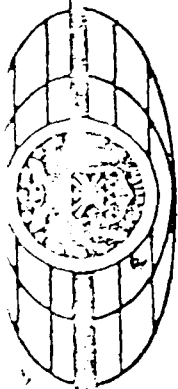
As I mentioned earlier, the Air Force productivity umbrella covers many programs ongoing in the Air Force that have productivity ramifications. I have listed a representative sampling of those programs here for your information. Of course it is not at an all-inclusive list.

SLIDE 23

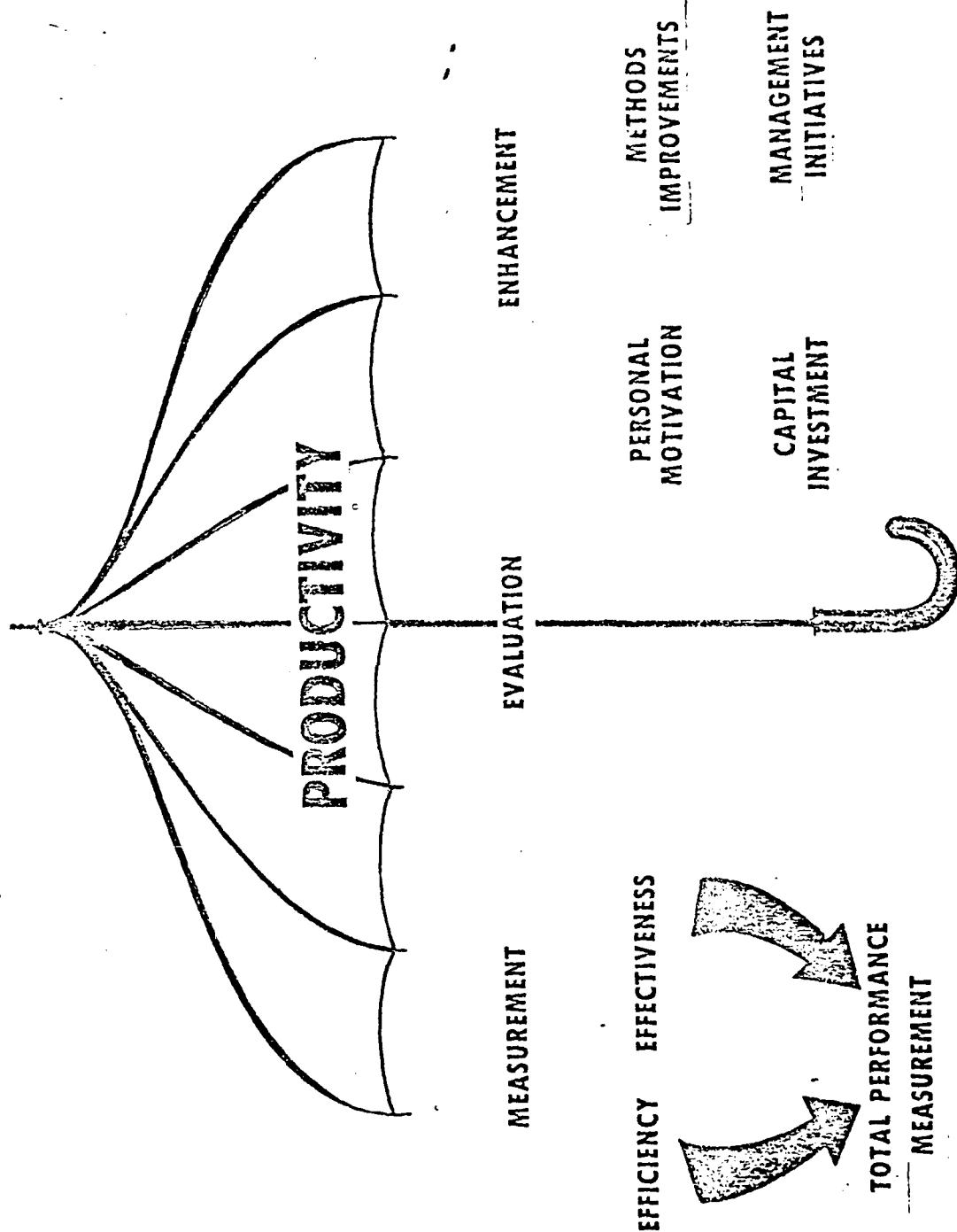
Our approach is to develop a functioning, credible Air Force Productivity Program. I discussed basically the three legs of our plan of attack, the Capital Investment Program, the Air Force Plan and Regulation--which you could really call the stick, with the Capital Investment Program being the carrot--and our Education Program, which is designed to make everybody in the Air Force aware of productivity and/or thinking productivity. What I would like to see come out of this symposium are your recommendations for improving this plan of attack, with particular emphasis on quick application. Those things that we can do, should be doing today, and we just haven't thought of yet. I want your ideas on this and your recommendations of what can be done today to improve the Air Force Productivity Program. Thank you.

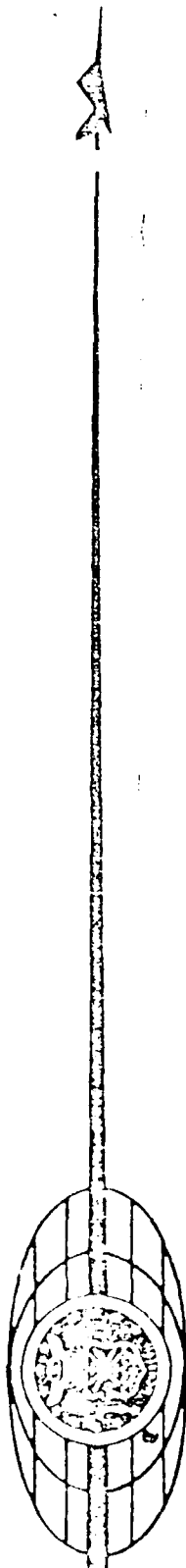


WORK SMARTER, NOT HARDER



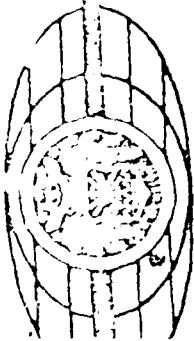
DEPUTY CHIEF OF STAFF MANPOWER & PERSONNEL
AIR FORCE PRODUCTIVITY PROGRAM





OVERVIEW

- CURRENT INTEREST
- CAPITAL INVESTMENT PROGRAMS
- USAF ACTIONS



CURRENT INTEREST

• NATIONAL PRODUCTIVITY COUNCIL

• MEMBERSHIP

• DEPARTMENTS: COMMERCE, LABOR, TREASURY

• OFFICES: MANAGEMENT & BUDGET, SCIENCE & TECHNOLOGY POLICY,

SPECIAL REPRESENTATIVE FOR TRADE NEGOTIATIONS, PERSONNEL MANAGEMENT

• COUNCILS: WAGE & PRICE STABILITY, ECONOMIC ADVISORS, ENVIRONMENTAL QUALITY

• CHAIRED BY THE DIRECTOR, OFFICE OF MANAGEMENT & BUDGET

• CONGRESS

• JOINT ECONOMIC COMMITTEE

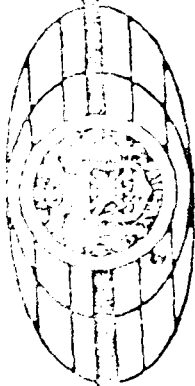
• SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT

• HOUSE POST OFFICE AND CIVIL SERVICE COMMITTEE

• SUBCOMMITTEE ON HUMAN RESOURCES

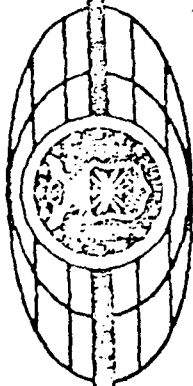
• HOUSE COMMITTEE ON EDUCATION AND LABOR

• SUBCOMMITTEE ON LABOR STANDARDS



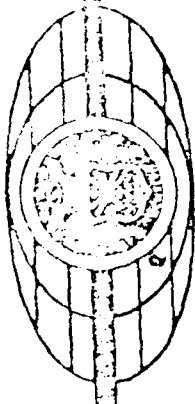
SENATE ARMED SERVICES COMMITTEE

THE COMMITTEE IS CONCERNED ABOUT CURRENT PRODUCTIVITY LEVELS IN DEFENSE ACTIVITIES, PARTICULARLY IN ACTIVITIES FOR MAINTENANCE AND OVERHAUL OF AIRCRAFT, SHIPS AND OTHER EQUIPMENT. THE COMMITTEE REQUESTS THAT A SEPARATE ANALYSIS OF PRODUCTIVITY BE INCLUDED IN THE MILITARY MANPOWER REQUIREMENTS REPORT FOR FISCAL YEAR 1980 INCLUDING SPECIFIC PRODUCTIVITY MEASURES AND AN ANALYSIS OF CHANGES IN PRODUCTIVITY OVER TIME, DESCRIPTION OF THE RESPONSIBILITIES FOR PRODUCTIVITY MEASUREMENT AND IMPROVEMENT IN EACH SERVICE AND THE DEFENSE AGENCIES, AND A LISTING OF PRODUCTIVITY CHANGES INCLUDED IN THE FISCAL YEAR 1980 BUDGET."



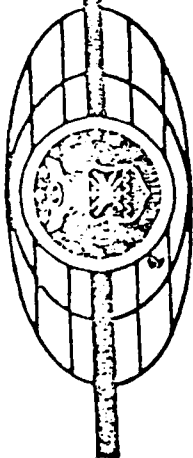
CURRENT INTEREST (CONTINUED)

- CONGRESS (CONTINUED)
 - FY 80 DOD MANPOWER REQUIREMENTS REPORT
 - DOD PRODUCTIVITY PROGRAM
 - SYSTEMS APPROACH TO ENHANCEMENT, MEASUREMENT, AND EVALUATION
 - PROPER USE OF ALL DISCIPLINES AND TECHNIQUES
 - AGGRESSIVE METHODS AND STANDARDS IMPROVEMENT EFFORT
 - SYSTEMATIC APPROACH TO CAPITAL INVESTMENT
 - USE OF PRODUCTIVITY TREND DATA IN RESOURCE MANAGEMENT
 - REALISTIC PRODUCTIVITY ENHANCEMENT GOALS
 - PERIODIC EVALUATION OF PROGRESS
 - SERVICE PROGRAMS



CURRENT INTEREST CONT ...

- DOD
 - DOD's OASD (MRA & L)
 - PRODUCTIVITY ENHANCING CAPITAL INVESTMENT
 - WORK METHODS AND STANDARDS
 - WORK FORCE MOTIVATION
 - PRODUCTIVITY MEASUREMENT, REPORTING, AND EVALUATION
 - BUDGET GUIDANCE--OASD(C)
 - EMPHASIS
 - GOALS



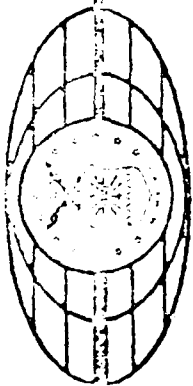
CURRENT INTEREST CONT ...

- FY 81-85 POM

- GOALS

- CURRENT PROGRAMS

- CAPITAL/LABOR SUBSTITUTION
- WORK METHOD IMPROVEMENTS
- MANAGEMENT ENGINEERING PROGRAM
- MANPOWER SAVINGS REINVESTMENT



CAPITAL INVESTMENT PROGRAMS

CURRENT

≥ \$900, 000

- MAJOR PEI

- \$1M OSD PIF

< \$900, 000

- NON-MAJOR PEI

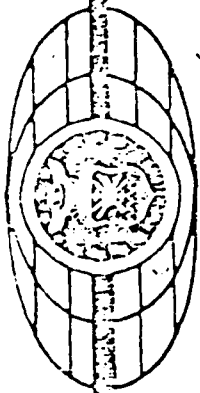
- FAST PAYBACK PEIS

≤ \$300, 000

- INDUSTRIAL FUND

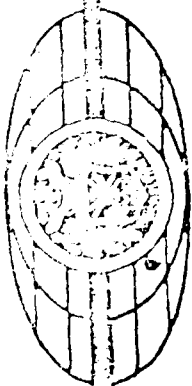
≤ \$100, 000

- PEIF (FASCAP)



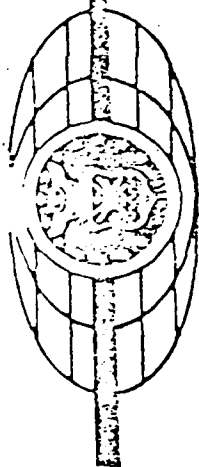
FAST PAYBACK CAPITAL INVESTMENT (FASCAP)

- INVEST IN EQUIPMENT
 - AMORTIZE IN TWO YEARS
 - "OFF THE SHELF"
 - FUNDS AVAILABLE 60 DAYS AFTER PROJECT IDENTIFICATION
- VERIFICATION OF SAVINGS
- MANDATORY COST TRACK REPORTS
- RESTRICTIONS
 - LEASE TO PURCHASE
 - \$100,000 PER PROJECT



PROJECT EXAMPLES

<u>EQUIPMENT</u>	<u>COST</u>	<u>2 YR SAVINGS</u>
PROGRAMMABLE CALCULATOR	\$11,865	\$40,000
SURVEILLANCE SYSTEM	22,132	110,960
TIRE BEAD BREAKER	3,000	10,640

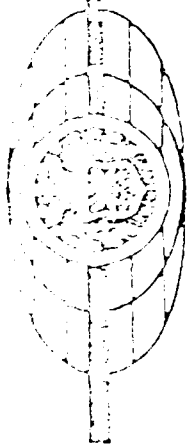


FASCAP TRACK RECORD

	<u>FY 77</u>	<u>FY 79</u>
PROJECTS SUBMITTED	212	122
PROJECTS APPROVED	157	89
PROJECT PENDING	0	13
BUDGET IN MILLIONS	\$ 6.5	\$ 3.6
*INVESTED IN MILLIONS	\$ 6.5	\$ 1.7
TWO YEAR SAVINGS	\$12.2 (<u>2:1</u>)	\$ 3.2 (2:1)
LIFE CYCLE SAVINGS	\$51.8 (<u>8:1</u>)	\$13.7 (8:1)
MANPOWER SAVED	282	45

*\$3M - FY 77 BACKLOG

1-4-1-2



INDUSTRIAL FUND FAST PAYBACK

• INDUSTRIAL FUNDS USED FOR PRODUCTIVITY INVESTMENTS

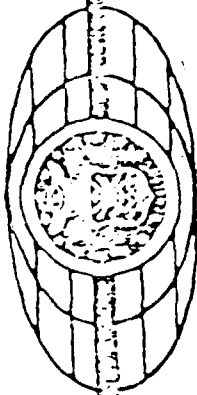
• "OFF THE SHELF" EQUIPMENT

- AMORTIZE IN THREE YEARS
- UP TO \$300K PER PROJECT

• APPROVAL LEVEL - OSD

- MAJCOM UP TO \$100K

TRACK RECORD	<u>FY 77</u>	<u>FY 78</u>	<u>FY 79</u>
• INVESTED (\$M)	.21	.16	.34
• SAVINGS (\$M)			
2 YEAR	.65 (3:1)	.20 (1:1)	1.5 (4:1)
LIFE CYCLE	2.3 (11:1)	.73 (5:1)	5.2 (15:1)



OSD PRODUCTIVITY INVESTMENT FUND

- \$105M SET ASIDE BY DOD
- PROJECTS SELECTED BY RATE OF RETURN
- ENTERED INTO NORMAL BUDGET PROCESS
- PROJECT CRITERIA
 - \$1M FLOOR
 - 4 YEAR AMORTIZATION
 - 50% MANPOWER SAVINGS
- SAVINGS RE-INVESTED AT LEVEL OF ORIGIN

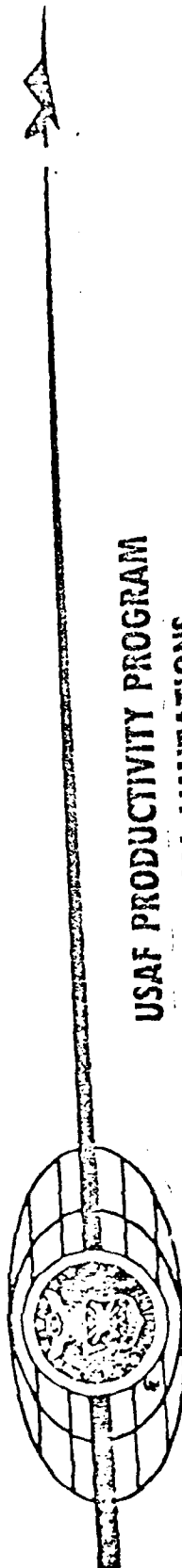


PROJECT EXAMPLES

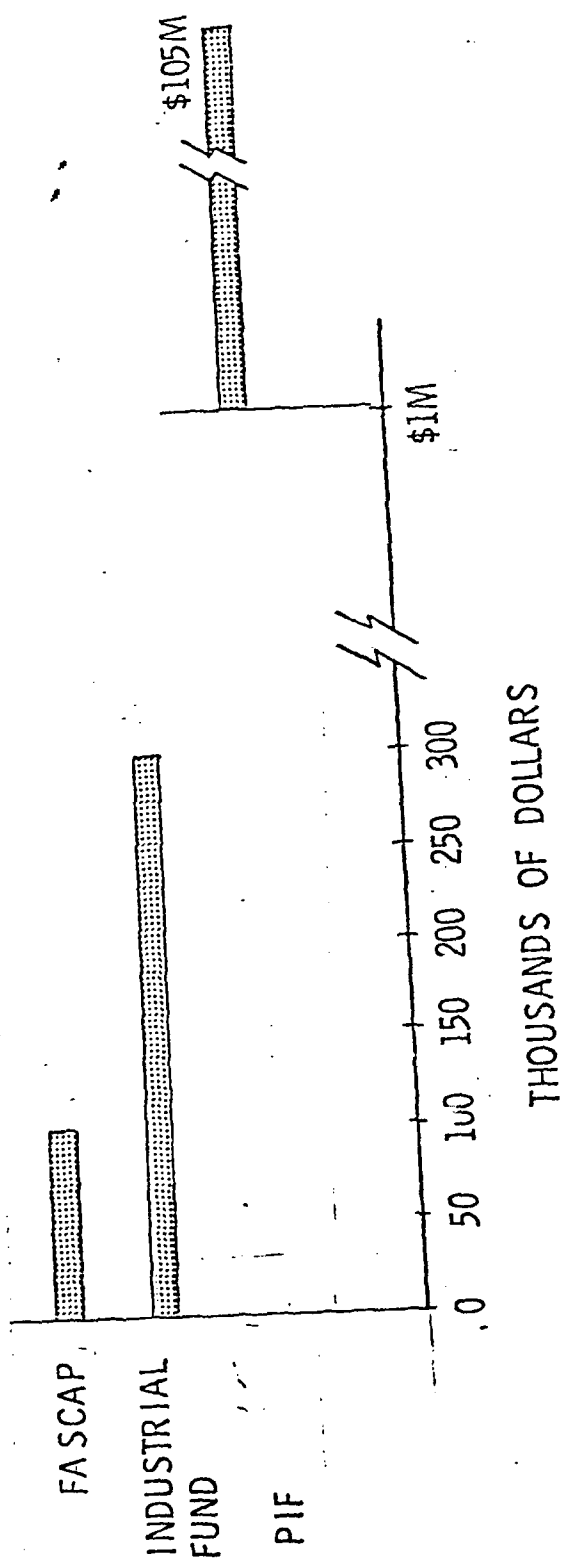
<u>NAME</u>	<u>COST</u>	<u>SAVINGS \$ MANPOWER</u>	<u>(INTERNAL) RATE OF RETURN</u>
NUMERICAL CONTROL MACHINING EQUIPMENT	\$1.57 M	3.43 M 40	40.84 %
INTRUSION DETECTION SYSTEM FOR SHELTERED A/C	7.02 M	9.67 M 224	30.93
B-52 COMPANION TRAINER AIRCRAFT	117.9 M	512.1 M 1416	22.14
ADVANCED WORD PROCESSING SYSTEM	1.33 M	1.83 M 13	13.06

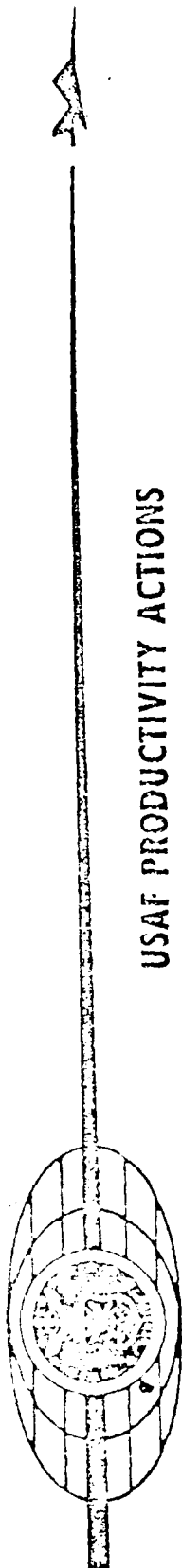
SUMMARY:

- TOTAL AF INVESTMENT SUBMISSIONS \$424M
- PROJECTED FOUR YEAR PAYBACK BENEFITS \$601M
- POTENTIAL MANPOWER REALIGNMENTS 2,064

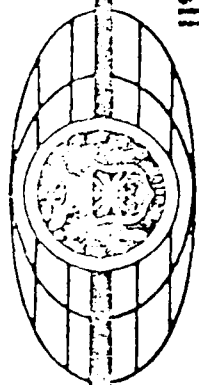


USAF PRODUCTIVITY PROGRAM FISCAL LIMITATIONS



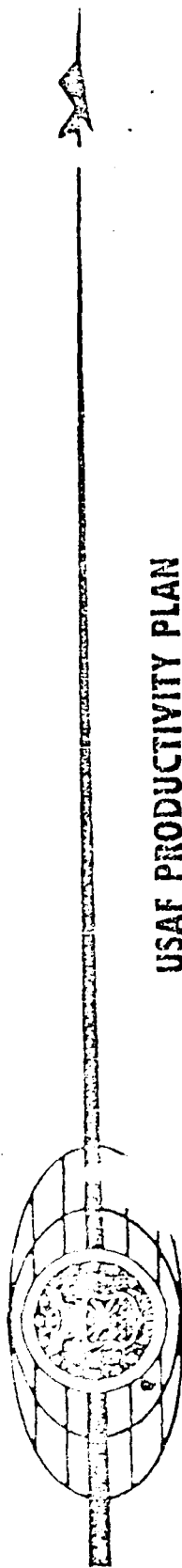


- SENIOR LEADERSHIP SUPPORT AND INVOLVEMENT
- AIR STAFF PRODUCTIVITY COMMITTEE
- WORLDWIDE PRODUCTIVITY CONFERENCE
- USAF PRODUCTIVITY PLAN



USAF WORLDWIDE PRODUCTIVITY CONFERENCE

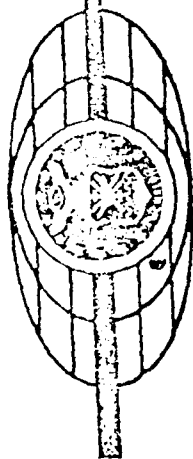
- BROAD REPRESENTATION
- NATIONAL AND USAF CONCERN
- CONFERENCE RECOMMENDATIONS
 - REQUIRE TOP LEVEL MANAGEMENT SUPPORT
 - FOCUS AT ALL LEVELS
 - USE CURRENT MANAGEMENT INFORMATION SYSTEMS
 - ESTABLISH GOALS AT BASE LEVEL
 - MOTIVATE PEOPLE - THE KEY
 - PUBLICIZE BENEFITS
 - REDISTRIBUTE SAVINGS AT ORIGINATING LEVEL
 - USAF PRODUCTIVITY PLAN



USAF PRODUCTIVITY PLAN

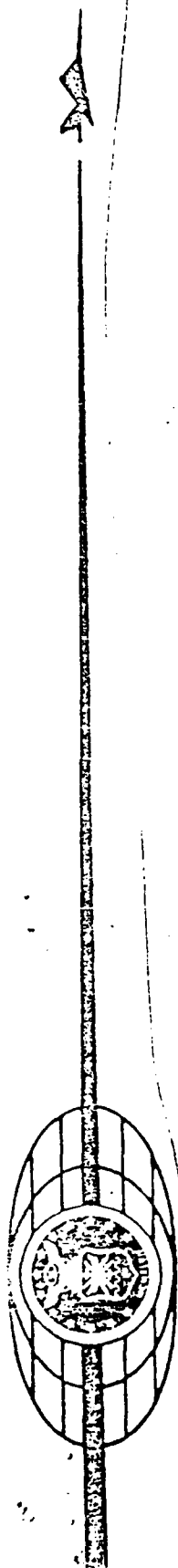
- PLANNING AT ALL ORGANIZATIONAL LEVELS
- GOALS
- REPORTING
- PRODUCTIVITY WORKSHOP





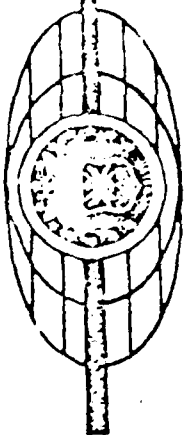
USAF PRODUCTIVITY ACTIONS

- SPREAD THE WORD
 - PRODUCTIVITY IS EVERYBODY'S BUSINESS
 - THINK PRODUCTIVITY
- REFINE PRODUCTIVITY PLANS
- DEVELOP INVESTMENT PROGRAM TO COMPLEMENT FASCAP
- STAFF AND PUBLISH REGULATION
- SATISFY CONGRESSION AND JCS/OSD REQUIREMENTS

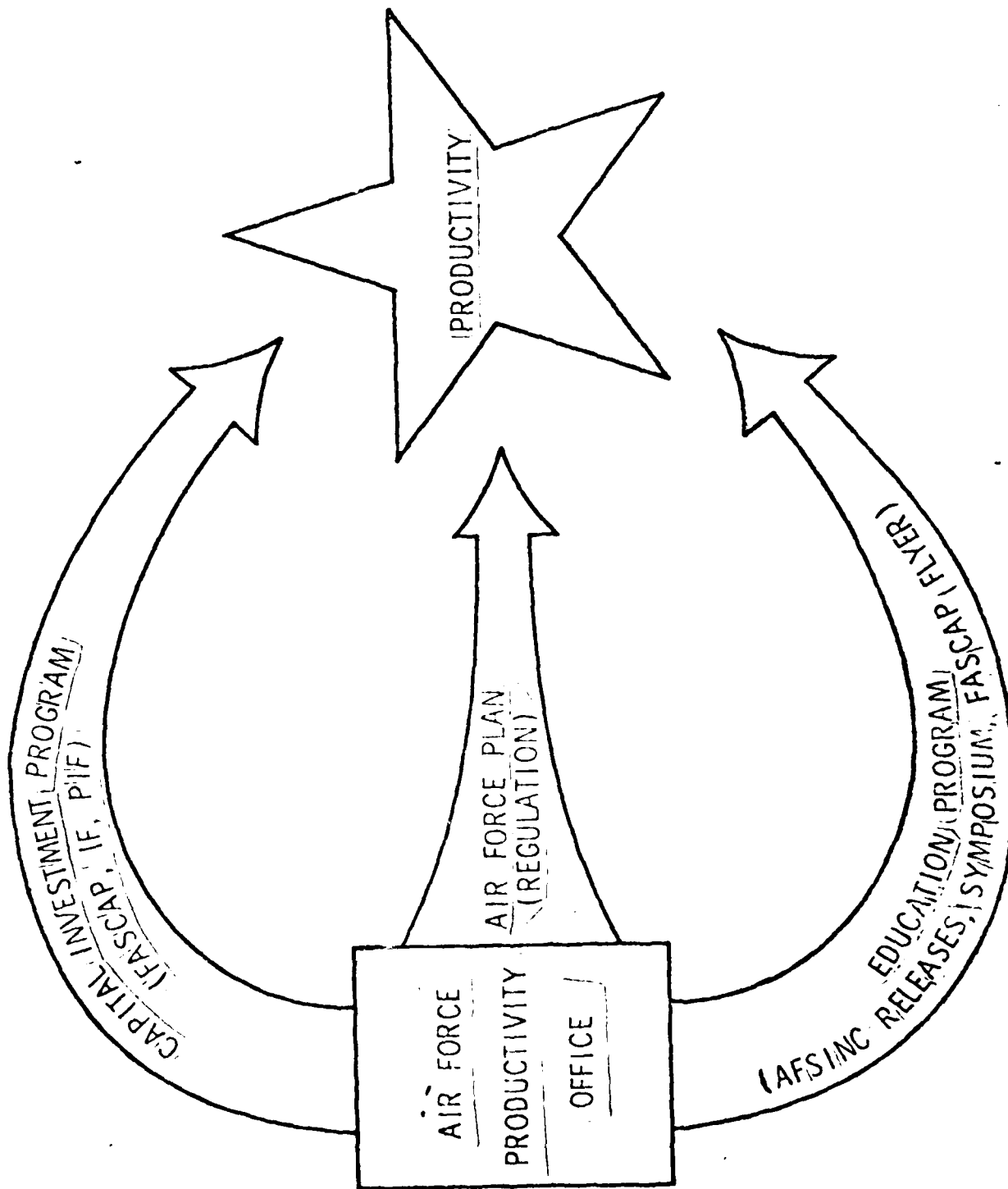


PRODUCTIVITY RELATED INITIATIVES

- JOINT LABOR - MANAGEMENT COUNCILS
- AIR FORCE SUGGESTION PROGRAM
- JOB ENRICHMENT TEAMS
- MANAGEMENT ENGINEERING DETACHMENTS
- PRAM - PRODUCTIVITY, RELIABILITY, AVAILABILITY,
MAINTAINABILITY
- ABLE CHIEF - BRIGHT SPARK



PLAN OF ATTACK



The Organizational Assessment Package (OAP) Survey

Briefer

Lt Col David A. Wilkerson, USAF

**THE ORGANIZATIONAL
ASSESSMENT PACKAGE
(OAP) SURVEY**

CRITERIA

• SINGLE VS MULTIPLE

• SINGLE IN TERMS OF

- Performance Goals
- Beneficiaries

• CONSIDERATION OF 7 CRITERIA OF ORGANIZATIONAL EFFECTIVENESS

(CUNNINGHAM - Academy of Management - July 1977, pp. 463-474).

• COLLECTING UNIT CRITERIA

• COMBINING MULTIPLE CRITERIA

- Rational Weighting
- Policy Capturing
- Policy Specifying

**BACKGROUND OF
THE ORGANIZATIONAL
ASSESSMENT PACKAGE
(OAP) SURVEY**

ORGANIZATIONAL ASSESSMENT PACKAGE (OAP) DEVELOPMENT

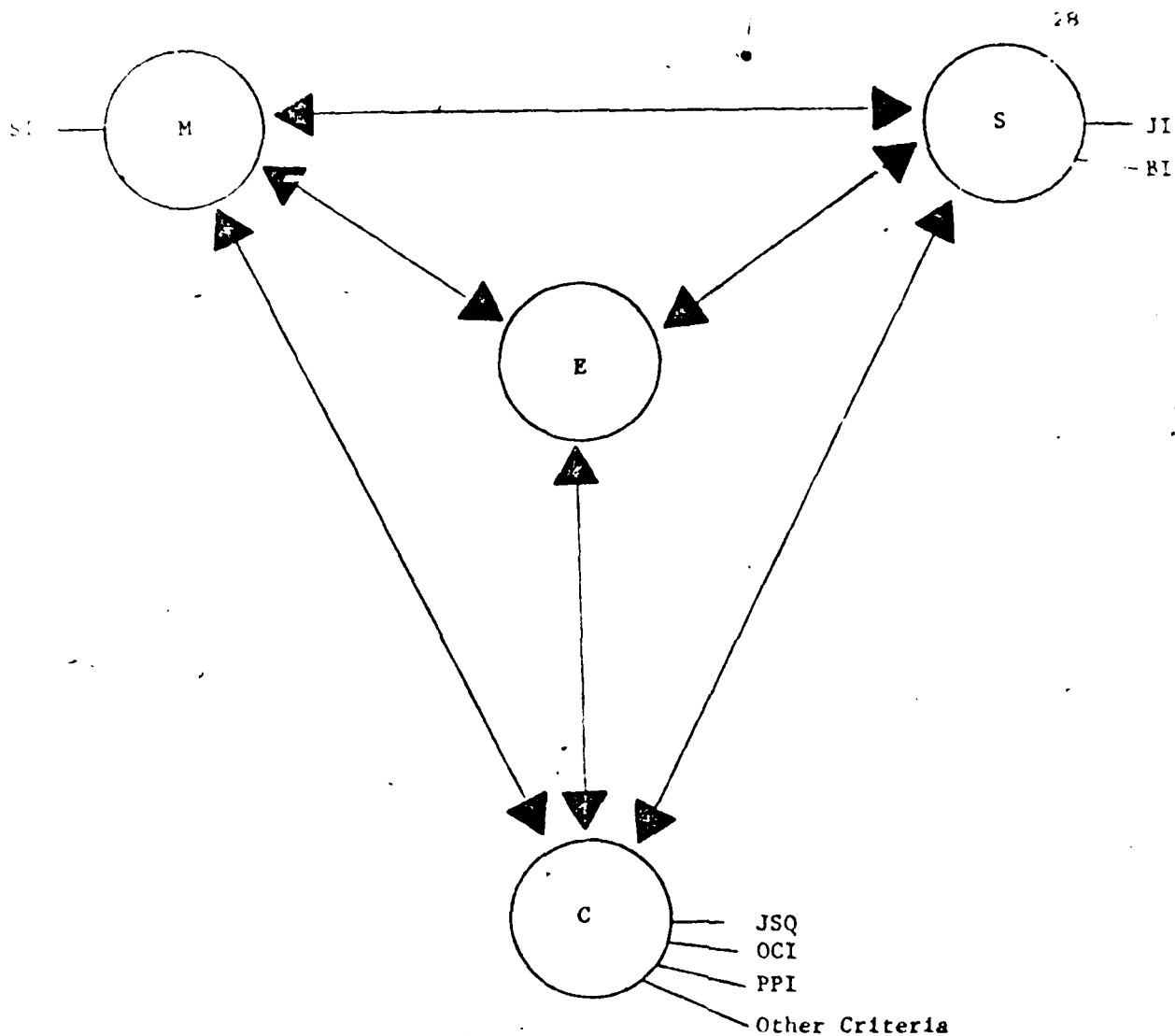
- PRELIMINARY DEVELOPMENT

- MODEL

- INVENTORIES

- Modular

- Benefit for Pre-Post Test Designs.



Legend:

M = Management Style
SI = Supervisory Inventory

S = Situational Environment
JI = Job Inventory
BI = Background Information

C = Criterion
JSQ = Job Satisfaction Questionnaire
OCI = Organizational Climate Inventory
PPI = Perceived Productivity Inventory

•FEASIBILITY WORKSHOP

•FIELD TEST OF MINI-SURVEYS

•AFHRL/LMDC JOINT
DEVELOPMENT

◦ JUNE 1977 MANAGEMENT CONSULTATION
R&D TEAM FORMED

◦ JULY 1977 - DEC 1977 AFHRL - INTERNAL
VALIDATION

◦ JAN - JULY 1978 LMDC FIELD VALIDATION

◦ SEPT 1978 OPERATIONAL IMPLEMENTATION

TABLE 12
OAP Section Factor Analysis
(Rotated Factors)

Section/Factor	Percent Total Variance	Highest Loading	Loadings Above .50
<u>JOB INVENTORY</u>			
Job Enrichment	12.24	.73	9
Freedom-Autonomy	6.34	.79	3
Time Management	6.82	.80	4
Supervisor Influence	7.33	.77	4
Advancement	4.95	.80	3
Work Group Performance	5.90	.74	3
Equipment--Work Space	3.90	.74	2
Work Repetition	4.11	.81	2
Task Accomplishment	4.06	.64	3
TOTAL	55.70		
<u>ORGANIZATIONAL CLIMATE INVENTORY</u>			
General Climate	33.56	.76	17
Communications/Planning	24.62	.86	8
TOTAL	58.18		
<u>SUPERVISORY INVENTORY</u>			
Management-Supervision	30.56	.77	27
Supervisor Assistance/Feedback	26.51	.76	20
Autonomous Control	5.59	.69	4
TOTAL	62.63		
<u>NEED FOR ENRICHMENT (NEI)</u>			
Meaningful-Responsible Work	49.17	.87	8
Repetitive-Easy Job	15.92	.85	2
TOTAL	65.09		
<u>PERCEIVED PRODUCTIVITY</u>			
High Productivity	43.82	.83	5
Performance Disruption	17.51	.78	2
TOTAL	61.32		
<u>JOB SATISFACTION</u>			
General Satisfaction	36.50	.77	15
Base Facilities	8.70	.79	3
Training	5.37	.53	2
Local Area--Social	5.17	.67	2
TOTAL	55.74		

DEVELOPMENT OF CRITERIA PREDICTION EQUATIONS

PREDICTION OF CRITERIA USING JOB INVENTORY OR SUPERVISOR INVENTORY.

- Job Satisfaction
- General Organizational Climate
- Perceived Productivity

TABLE 5
Job Inventory and Supervisor Inventory Regression Analyses

Analysis Number	Inventory	General Organizational Climate	Organizational Communications Climate	Job Related Satisfaction	Positive Perceived Productivity
1-4	Job Inventory	.52	.24	.52	.43
5-8	Supervisor Inventory	.42	.19	.27	.30
9-12	Job and Supervisor Inventories	.57	.30	.55	.47

FUTURE DEVELOPMENTS

- LMDC

- Stress Study

- TAC Study

- AFIT

- Stress Study

- Improved Inventories

- Supervisor Inventory

- Job Inventory

- Criteria Inventories

MEAN PERCEIVED PRODUCTIVITY
BY
PERSONNEL CATEGORY, SEX AND JOB LOCATION

<u>OFFICER</u>	<u>AIR-BASE WING</u>			<u>A/C MNX</u>			<u>A/C OPS</u>			<u>MEDICAL</u>			<u>TOTAL</u>		
	\bar{x}	sd	n	\bar{x}	sd	n	\bar{x}	sd	n	\bar{x}	sd	n	\bar{x}	sd	n
MALE	5.92			6.00			5.84			5.79			5.86		
	1.03			1.03			1.03			1.08			1.04		
	406			68			422			329			1225		
FEMALE	5.43			5.77			4.88			5.69			5.63		
	0.94			0.86			1.45			1.23			1.17		
	27			12			5			126			170		
<u>ENLISTED</u>															
	\bar{x}	sd	n	\bar{x}	sd	n	\bar{x}	sd	n	\bar{x}	sd	n	\bar{x}	sd	n
MALE	5.48			5.54			5.87			5.54			5.52		
	1.35			1.19			1.15			1.27			1.28		
	3260			2294			212			783			6549		
FEMALE	5.45			5.05			5.58			5.23			5.32		
	1.27			1.36			1.19			1.28			1.29		
	456			176			38			265			935		
TOTALS BY															
<u>JOB LOCATION</u>	5.52			5.52			5.83			5.56					
	1.32			1.20			1.08			1.24					
	4149			2550			677			1503					

OMB Circular A-76 Cost Studies

Briefer

Lt Col David Muzio, USAF

OFFICE OF MANAGEMENT AND BUDGET

CIRCULAR A-76

29 MARCH 1979

"POLICIES FOR ACQUIRING COMMERCIAL OR INDUSTRIAL PRODUCTS AND SERVICES NEEDED BY THE GOVERNMENT."

BACKGROUND

IN A DEMOCRATIC FREE ENTERPRISE ECONOMIC SYSTEM, THE GOVERNMENT SHOULD NOT COMPETE WITH ITS CITIZENS. THE PRIVATE ENTERPRISE SYSTEM, CHARACTERIZED BY INDIVIDUAL FREEDOM AND INITIATIVE, IS THE PRIMARY SOURCE OF NATIONAL ECONOMIC STRENGTH. IN RECOGNITION OF THIS PRINCIPLE, IT HAS BEEN AND CONTINUES TO BE THE GENERAL POLICY OF THE GOVERNMENT TO RELY ON COMPETITIVE PRIVATE ENTERPRISE TO SUPPLY THE PRODUCTS AND SERVICES IT NEEDS.

DEFINITION

A COMMERCIAL OR INDUSTRIAL ACTIVITY IS A PRODUCT OR SERVICE THAT COULD BE OBTAINED FROM A PRIVATE SOURCE.

AUDIOVISUAL PRODUCTS AND SERVICES

AUTOMATIC DATA PROCESSING

MAINTENANCE, OVERHAUL AND REPAIR

SYSTEMS ENGINEERING, INSTALLATION, OPERATION, AND MAINTENANCE
MANUFACTURING, FABRICATION, PROCESSING AND PACKAGING

REAL PROPERTY

INDUSTRIAL SHOPS AND SERVICES

HEALTH SERVICES

TRANSPORTATION

PRINTING AND REPRODUCTION

RESEARCH AND DEVELOPMENT

OFFICE SERVICES

SECURITY

FOOD SERVICES

OTHER

POLICY

AIM FOR ECONOMY

WHEN PRIVATE PERFORMANCE IS FEASIBLE AND NO OVERRIDING FACTORS REQUIRE IN-HOUSE PERFORMANCE, THE AMERICAN PEOPLE DESERVE AND EXPECT THE MOST ECONOMICAL PERFORMANCE AND, THEREFORE RIGOROUS COMPARISON OF CONTRACT COSTS VERSUS IN-HOUSE COSTS SHOULD BE USED.

ALL CITA ACTIVITIES SHALL BE INVENTORIED AND SCHEDULED FOR REVIEW IN NEXT 5 YEARS.

SCHEDULE SHALL BE MADE AVAILABLE TO ALL POTENTIALLY AFFECTED EMPLOYEES AND THEIR REPRESENTATIVES, AND PUBLISHED FOR THE INFORMATION OF CONTRACTORS.

SUBSEQUENT REVIEWS EVERY 5 YEARS.

REVIEW

STAY IN-HOUSE WITHOUT COST COMPARISON

NATIONAL DEFENSE

- MILITARY ARE UTILIZED IN OR SUBJECT TO DEPLOYMENT IN A DIRECT COMBAT SUPPORT ROLE.
- ESSENTIAL FOR TRAINING THOSE SKILLS WHICH ARE EXCLUSIVELY MILITARY IN NATURE.
- CAREER PROFESSION OR OVERSEAS ROTATION BASE.
- DEPOT OR IMMEDIATE LEVEL MAINTENANCE FOR MISSION ESSENTIAL EQUIPMENT TO THE MINIMUM NECESSARY TO ENSURE A READY AND CONTROLLED SOURCE OF TECHNICAL COMPETENCE AND RESOURCES NECESSARY TO MEET MILITARY CONTINGENCY

NO SATISFACTORY COMMERCIAL SOURCE AVAILABLE

STAY CONTRACT WITHOUT COST COMPARISON

CONTRACTS UNDER AUTHORIZED SET ASIDE PROGRAMS

REVIEW (CONTINUED)
COST COMPARISON STUDIES
ALL OTHER ACTIVITIES

DOD

FY 79/80 - 1200

32,000 SPACES

FY 81 _____

FY 79 COST STUDY AREAS

AUDICVISUAL

AEROSPACE GUIDANCE AND METROLOGY CENTER

BASE OPERATING SUPPORT (RICHARDS-GEBAUR)

BASE SUPPLY

BOMARC

COMMISSARY SHELF STOCKING

CUSTODIAL

FAMILY HOUSING MAINTENANCE

REFUSE COLLECTION

FOOD SERVICE

FUELS MAINTENANCE

HOSPITAL CUSTODIAL

LAUNDRY/DRY CLEANING

MASDC (DAVIS-MONTHAN)

PMEL

RADAR MAINTENANCE

TRACKING FACILITY

TRAINER FABRICATION

FY 80 COST STUDY AREAS

TOTAL INSTALLATION SERVICES - 9
ADMINISTRATIVE TELEPHONE SERVICES - 14
ADP SYSTEM DESIGN, DEVELOPMENT AND PROGRAM SERVICES - 25
AIR CONDITIONING PLANTS OPERATIONS AND MAINTENANCE - 15
AIRCRAFT MAINTENANCE - 4 (EDWARDS)
AIRCRAFT FUELING - 2
AIRCRAFT TRAINING SIMULATORS OPERATIONS AND MAINTENANCE - 5
ALCOHOL AND DRUG ABUSE - 3
ALTERATION OF WEARING APPAREL - 1
AMMUNITION OPERATIONS - 1
ANG TRAINING SUPPORT - 11
ARMAMENT MAINTENANCE - 4
AUDIOVISUAL - 35
BOX MANUFACTURING - 5
BUILDING AND STRUCTURES MAINTENANCE - 12
BULK LIQUID STORAGE OPERATIONS - 9

PAST COST STUDY RESULTS

JUL 75 TO SEP 77

208 STUDIES

172 RESULTED IN CONTRACTS

3 YEAR SAVINGS \$ 140,434,000

MOST 25 - 35% SAVINGS

36 REMAINED IN-HOUSE

3 YEAR SAVINGS \$ 3,467,000

GOVERNMENT CAN COMPETE

EACH AGENCY SHOULD ASSURE THAT GOVERNMENT OPERATIONS ARE ORGANIZED AND STAFFED FOR THE MOST EFFICIENT PERFORMANCE, TO THE EXTENT PRACTICABLE AND IN ACCORDANCE WITH AGENCY MANPOWER AND PERSONNEL REGULATIONS, AGENCIES SHOULD PRECEDE REVIEWS UNDER THIS CIRCULAR WITH INTERNAL MANAGEMENT REVIEWS AND REORGANIZATION FOR ACCOMPLISHING THE WORK MORE EFFICIENTLY, WHEN FEASIBLE.

FY 80 APPROPRIATION ACT

SECTION 806

NO CITA FUNCTION PERFORMED BY DOD PERSONNEL MAY BE CONVERTED TO CONTRACT
TO CIRCUMVENT PERSONNEL CEILINGS

UNTIL SECRETARY OF DEFENSE PROVIDES TO CONGRESS

NOTIFICATION OF DECISION TO STUDY

CERTIFICATION THAT GOVERNMENT IN-HOUSE COST IS BASED ON AN ESTIMATE
OF THE MOST EFFICIENT AND COST EFFECTIVE ORGANIZATION FOR IN-HOUSE
PERFORMANCE

REPORT SHOWING POTENTIAL ECONOMIC EFFECT ON EMPLOYEES, LOCAL COMMUN-
ITY AND FEDERAL GOVERNMENT

EFFECT ON MILITARY MISSION

AMOUNT OF ACCEPTABLE BID

COST OF IN-HOUSE PERFORMANCE

COST OF CONTRACT ADMINISTRATION

NEW RULES

SUPPLEMENT NO. 1 COST COMPARISON HANDBOOK
RESOLVES ACCOUNTING COSTING PROBLEMS.
CONTRACT MUST BE MORE ECONOMICAL BY AT LEAST 10% OF
GOVERNMENT PERSONNEL COSTS

STATEMENT OF WORK IS THE BASIS OF THE COMPARISON
GOVERNMENT AND COMMERCIAL COST FIGURES MUST BE BASED ON
THE SAME SCOPE OF WORK AND THE SAME LEVEL OF PERFORMANCE.

SOW MUST HAVE PERFORMANCE STANDARDS THAT CAN BE
MONITORED FOR EITHER MODE (GOVT/CONT) OF PERFORMANCE.

SOW SHOULD STATE WHAT IS TO BE DONE WITHOUT PRESCRIBING
HOW IT IS TO BE DONE.

AFM 26-1 COST STUDY PROCEDURES

IN-HOUSE COST COMPUTATION BASED ON CONTRACT SOW.

SOW MAY BE WRITTEN WHICH IS DIFFERENT THAN ACCOMPLISHED IN HOUSE IN THE PAST.

MEI'S SHOULD NOT PRICE OUT WHAT IS IN THE MSL OR IN MANPOWER STANDARD.

IN-HOUSE COST BASED ON WORK FORCE ORGANIZED AND MANAGED IN THE MOST EFFICIENT WAY POSSIBLE TO ACCOMPLISH THE STATEMENT OF WORK. MUST HAVE A QUALITY ASSURANCE SURVEILLANCE PLAN.

CURRENT PROBLEMS

WHAT IS A PERFORMANCE STATEMENT OF WORK ?

NO "HOW TO" INFORMATION AVAILABLE

HOW DO WE ASSURE THAT THE PERFORMANCE STANDARDS ARE MET ?

SURVEILLANCE IS

NON-SYSTEMATIC

COMPLIANCE NOT PERFORMANCE ORIENTED

ACCEPTANCE

NO BASIS FOR ACCEPTANCE OR REJECTION

NO ABILITY TO QUANTIFY OUR LOSSES

DOD SCG OBJECTIVES

IMPROVE QUALITY OF SOW BY IDENTIFYING PERFORMANCE STANDARDS THAT CAN BE USED

IMPROVE THE CONSISTENCY WITHIN AND BETWEEN DOD COMPONENTS IN THE WAY REQUIREMENTS AND STANDARDS OF PERFORMANCE ARE STATED FOR COMMON FUNCTIONS

REDUCE MANPOWER REQUIREMENTS FOR PREPARING WORK STATEMENTS BY ENCOURAGING AND EXPEDITING THE MULTIPLE USE OF STANDARD WORK STATEMENTS WITHIN AND BETWEEN DOD COMPONENTS

PERFORMANCE SOW DEFINITION

A SOW THAT RELIES PRINCIPALLY UPON THE RESULTS OF A SERVICE RATHER THAN ON THE METHODS OR PROCESS.

THE KEY ELEMENTS ARE:

1. STATEMENT OF THE REQUIRED SERVICE AS AN END PRODUCT.
2. A MEASURABLE PERFORMANCE STANDARD OF THAT SERVICE. I.E., HOW FAST, HOW OFTEN, HOW MANY, ETC.
3. AN ALLOWABLE ERROR RATE FROM PERFECT (100%) PERFORMANCE.

MUST HAVE A METHOD OF SURVEILLANCE OR AN INSPECTION METHOD AND PROVISIONS FOR ENFORCEMENT OF THE STANDARDS OF PERFORMANCE.

AIR FORCE SERVICE CONTRACT ADVISORY GROUP

JUNE 1977

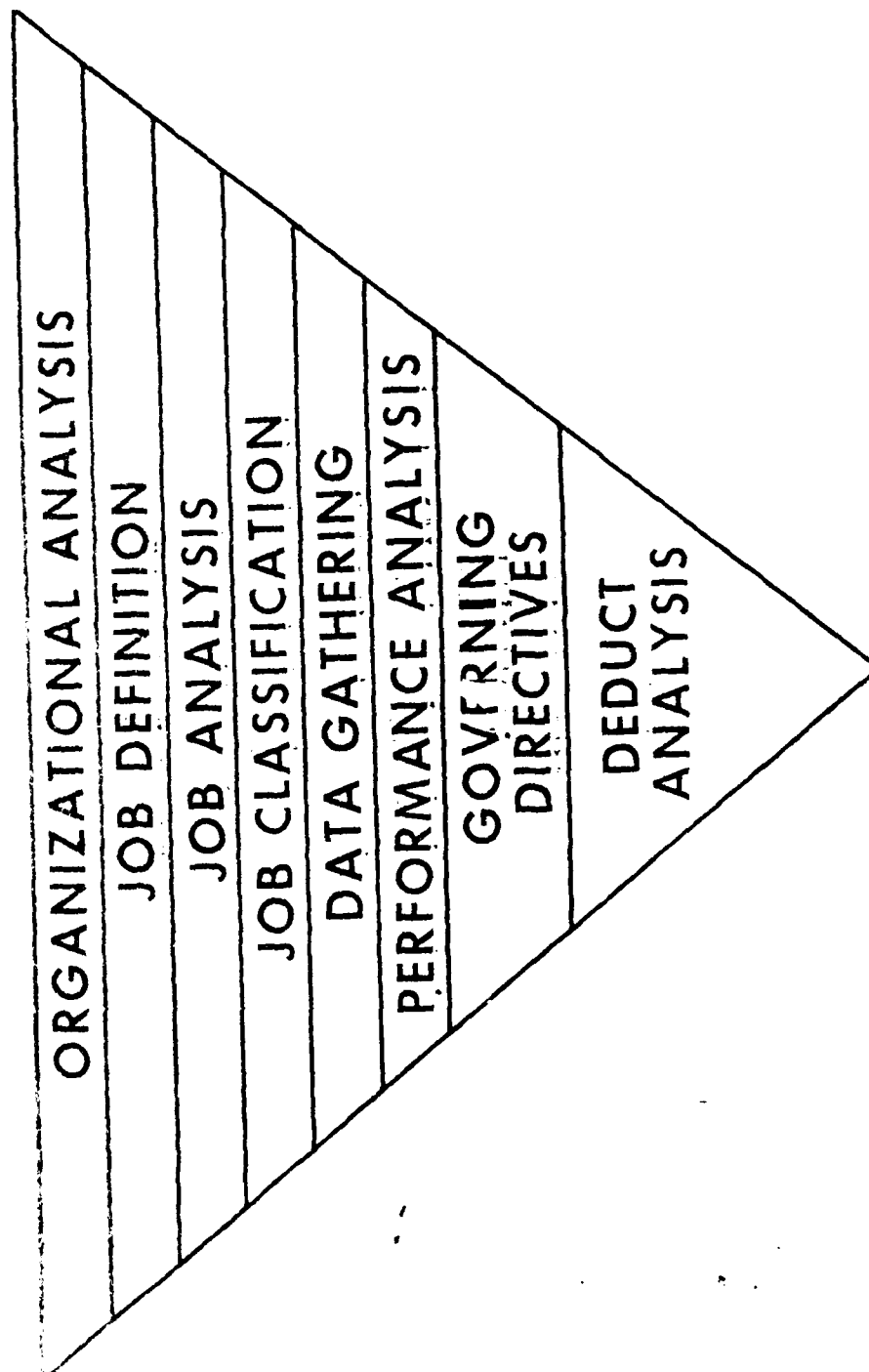
OBJECTIVE

- IMPROVE SERVICES RECEIVED THROUGH CONTRACTS
- IMPROVE IN-HOUSE ABILITY TO MEASURE CONTRACTORS
PERFORMANCE

MEMBERSHIP

- AIR STAFF DIRECTORATES
- MAJCOMS - CONTRACTING - FUNCTIONAL - EXPERTS
- AF/LMC - CONSULTANT

STRUCTURED ANALYSIS



SPECIFIC SERVICE + STANDARD +
ACCEPTABLE QUALITY LEVEL

VEHICLE OPERATIONS

Required Service	Standard	Maximum Allowable Degree of Deviation from Requirement (AQL)	Method of Surveillance	Deduction from Contract Price Exceeding the AQL
Taxi; Unscheduled Bus/Cargo Movement	Customer must be picked up within 4 min of the agreed upon time	15% (25%)	Random observations during the month	15%
Timely Scheduled Bus Service	Bus must not arrive at stop later than scheduled time +5 min or Depart stop earlier than scheduled time	15% (25%)	Random observations during the month	7%
Timely Vehicle Retrieval Service	Wrecker must respond not later than 15 mins from notification	N/A	Customer complaint	2%
Vehicle condition of contractor operated vehicles	Vehicles must be properly maintained, and receive required operator checks. Defects must be reported to maintenance	10% (15%)	Random observations during the month	6%
Flight Line Taxi	Vehicle(s) & Driver(s) available to Base Ops Supvr during hours specified	N/A	Monthly check with Base Ops Supvr	2%
Vehicle Control Officer Program	See para F-5, A.2(b)	2 Defects	Quarterly	1%

AUDIOVISUAL CONTRACT

\$471,000

- KEY PERFORMANCE INDICATORS:
 - PRODUCTION DEADLINES EXCEEDED
 - COMPLETED WORK REJECTED OR SUBSTANDARD
 - UNAUTHORIZED WORK REQUESTED
 - FILM LIBRARY PROVIDES SERVICEABLE MATERIAL OR EQUIPMENT
- CHECKLIST ITEMS:
 - 3 DAILY
 - 1 WEEKLY
 - 4 MONTHLY
 - 6 QUARTERLY

BASE TAXI SERVICE (DISPATCH)

- INDICATOR
 - RESPONSE TIME MUST NOT EXCEED 4 MINUTES
- LOT SIZE - 1100 PER MONTH
- SAMPLE SIZE - 80 PER MONTH
- ACCEPTABLE QUALITY LEVEL -15%
- PERFORMANCE CRITERIA
 - 21 OR LESS DEFECTS- SATISFACTORY
 - 22 OR MORE DEFECTS - UNSATISFACTORY
- DECISION TABLE

AIR FORCE SERVICE CONTRACT ADVISORY GROUP

<u>SOM</u>	<u>OPR</u>	<u>CURRENT VERSION</u>	<u>STATUS</u>
Vehicle Operations and Maintenance	AF/LETN	8 Jan 80	Mandatory. To be published as Vol II of AFR 400-28.
Audiovisual	AF/XOOTV	1 Jan 80	Mandatory. To be published as Vol III of AFR 400-28.
Bus Services	AF/LETN	1 Jan 80	Mandatory. To be published as Vol IV to AFR 400-28.
Family Housing Maintenance	AFESC/DEMG	1 Feb 80	Mandatory. To be published as Vol V to AFR 400-28.
Hospital Aseptic Management Services	AFMSC	1 Feb 80	Mandatory. To be published as Vol VI to AFR 400-28.
Medical Facility Housekeeping Services	AFMSC	1 Feb 80	Mandatory. To be published as Vol VII to AFR 400-28.
Commissary Shelf Stocking	AFCOMS	2 Jul 79	Mandatory. To be published as Vol VIII to AFR 400-28.
Transient Aircraft Maintenance	SAC	1 Feb 80	Mandatory. To be published as Vol IX to AFR 400-28.
Billeting	AFESC/DEHS	1 Feb 80	Mandatory. To be published as Vol X to AFR 400-28.

<u>SOM</u>	<u>OPR</u>	<u>CURRENT VERSION</u>	<u>STATUS</u>
Medical Facilities Real Property Maintenance Management	AFMHC	20 Nov 79	Mandatory for use in FY 80 cost studies.
Full Food Service	AFESC/DEHS	28 Dec 79	In test.
Food Service Attendant	AFESC/AFIMC	1 Aug 79	In test.
Custodial	AFESC/AFIMC	1 Aug 79	In test.
Refuse Collection	AFESC/AFIMC	1 Aug 79	In test. DAR deviation in work.
Grounds Maintenance	AFESC/DEMG	9 Nov 79	In test.
Local Personal Property Shipment	ATC/AFIMC	7 Nov 79	In test. DAR deviation in work.
Contractor Operated Civil Engineering Store (COCESS)	SAC	1 Jan 80	Final draft in review.
Laundry and Dry Cleaning	AFESC/DEHS	1 Feb 80	Final draft being prepared. DAR deviation in work.
Law Enforcement and Resources Protection	AFSC	5 Jun 79	Final draft being prepared. To be ready for February 80 AFSCAG.
Contractor Operated Parts Store (COPARS)	SAC	1 Feb 80	final draft being prepared.
Rental of Copier Machines	MAC	6 Dec 79	First draft in review.
Cable TV	AFCC	11 Jan 80	First draft in review.

AD-A098 043

LEADERSHIP AND MANAGEMENT DEVELOPMENT CENTER MAXWELL--ETC F/G 5/1
AIR FORCE PRODUCTIVITY SYMPOSIUM HELD 12-13 FEBRUARY 1980; MAXW--ETC(U)
JAN 81 K L HAMILTON, L O SHORT
LMDC-TR-81-1

UNCLASSIFIED

NL

3-3

AT
3-3-81



END

DATE
FILMED

81

DTIC

DEVELOPED FOR DLA

OFFICE EQUIPMENT REPAIR

FURNITURE REPAIR

SPECIAL EQUIPMENT REPAIR

PACKING AND CRATING

CENTRAL HEATING PLANT/HVAC

SURFACED AREA REPAIR

PRINTING AND DUPLICATING

ADMINISTRATIVE TELEPHONE

BOX MANUFACTURING

FY 79 COST STUDY RESULTS AS OF 14 SEP 79

COST SAVINGS

57 STUDIES	20%
44 CONTRACTS	24%
10 IN-HOUSE	11%

3 NON RESPONSIVE BIDDERS

3 STUDIES PROTESTED - TWO BY CONTRACTORS - ONE BY UNION

MANPOWER SAVINGS

IN-HOUSE BID VS ORIGINAL AUTHORIZATIONS

CONTRACT	16%
IN-HOUSE	34%
TOTAL	24%

NOTICE

More information about OMB Circular A-76 Cost Studies can be obtained from the Directorate of Contracting, Air Force Logistics Management Center, Gunter Air Station, AL 36114. Ask for the OMB Circular A-76 and Cost Comparison Handbook--Service Contracts: How to Write and Administer Them.

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